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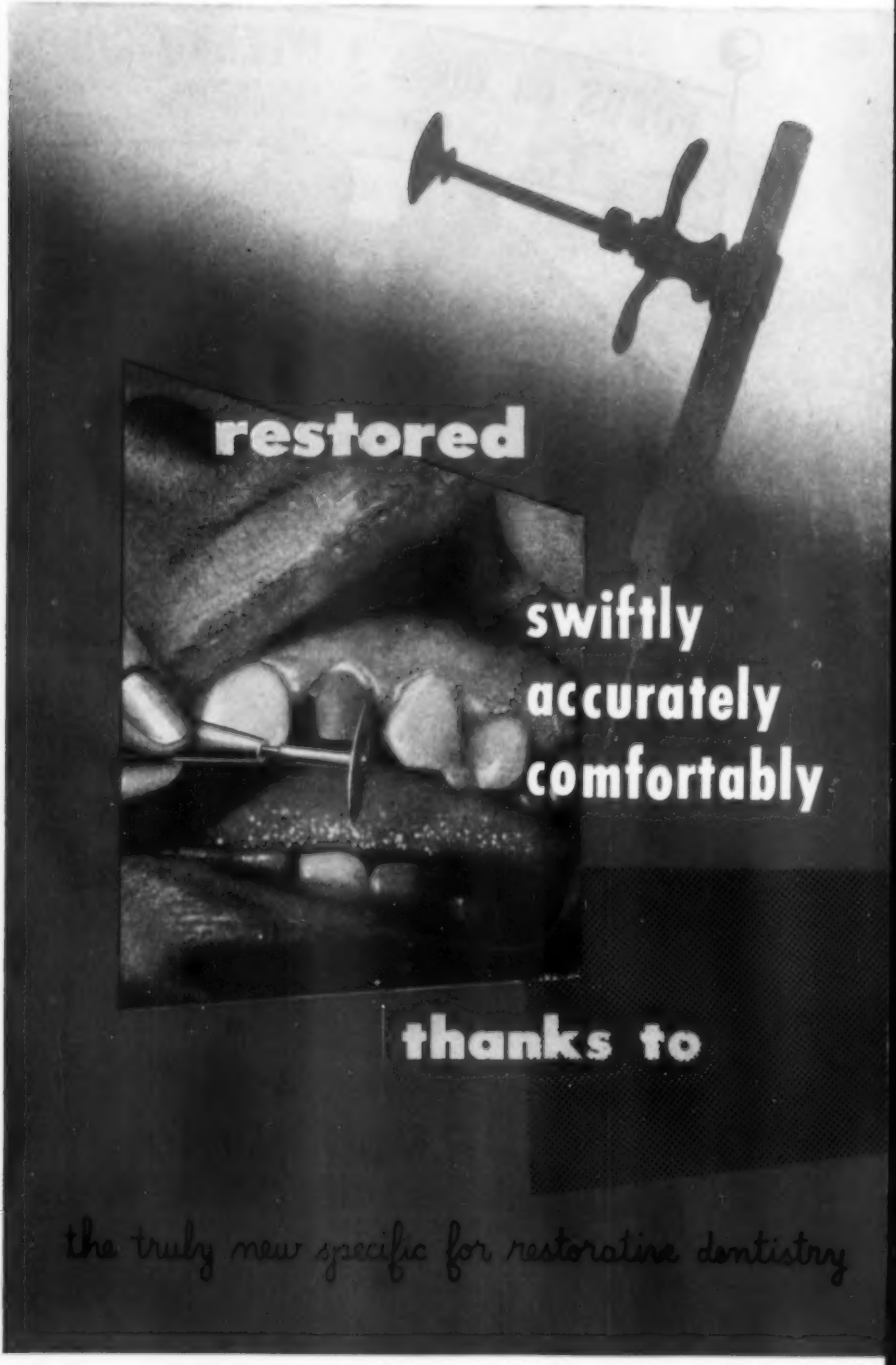
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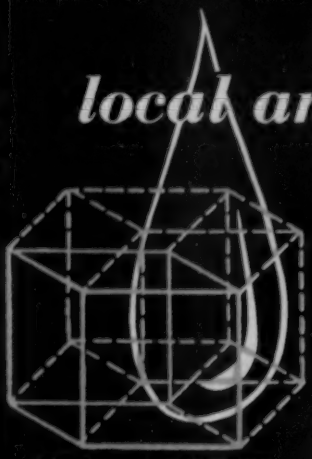

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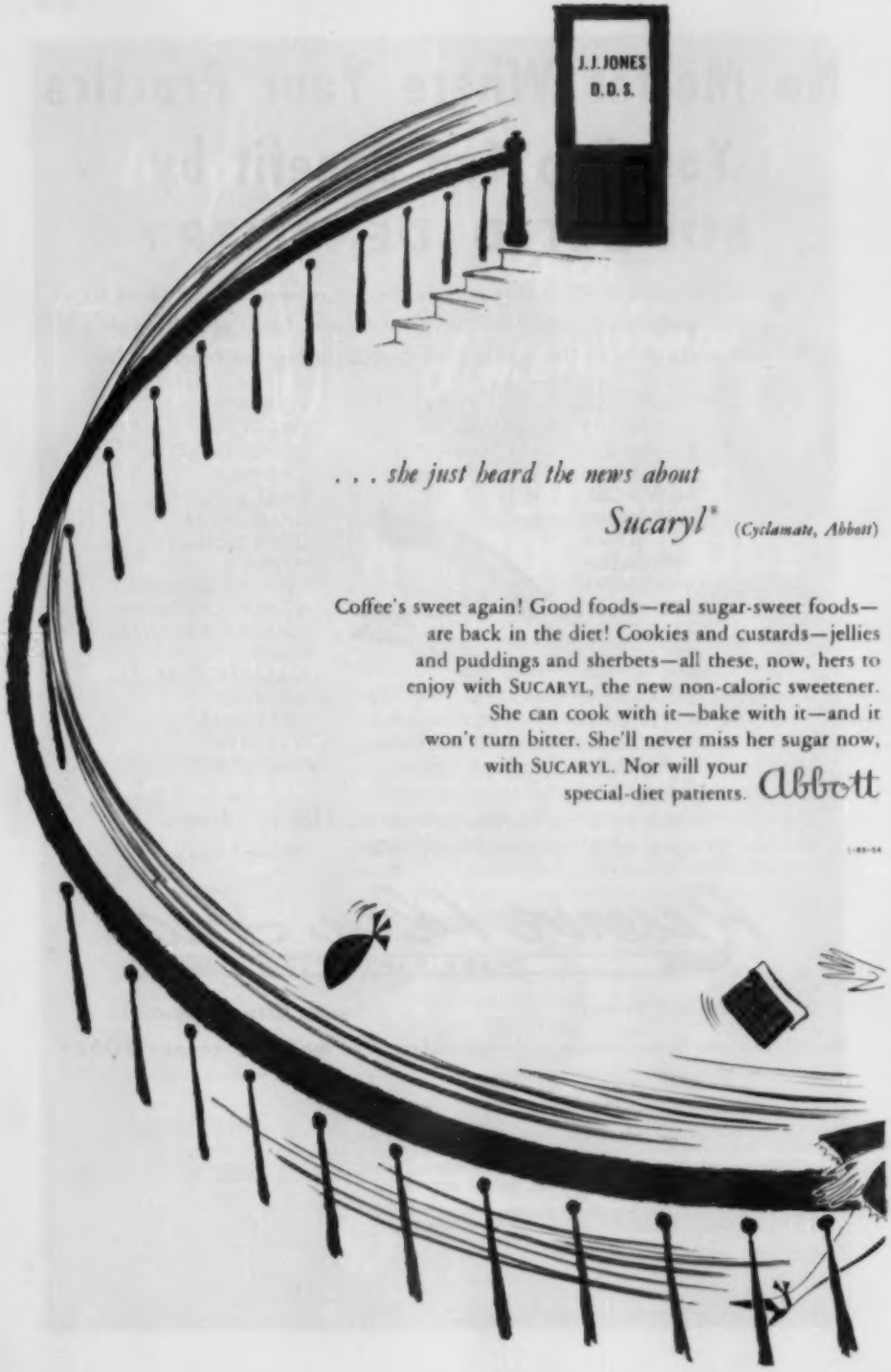

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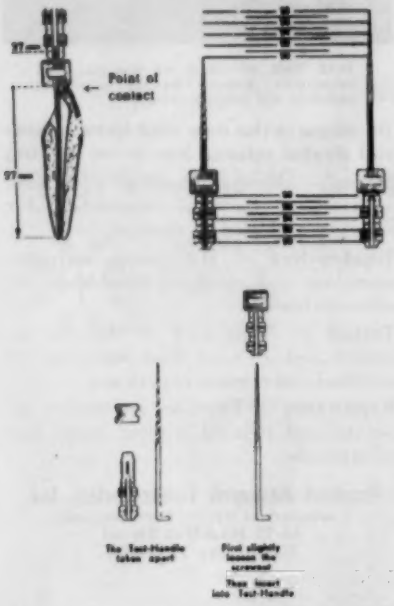

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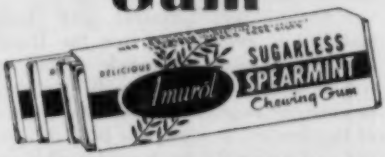

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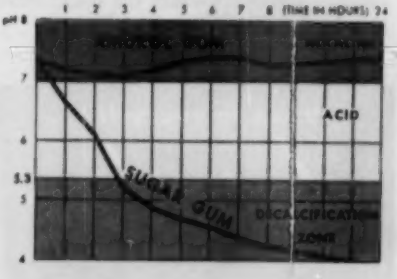

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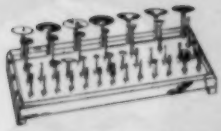

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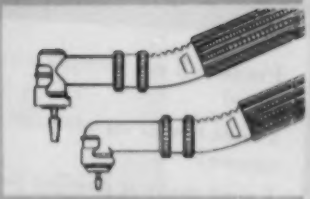

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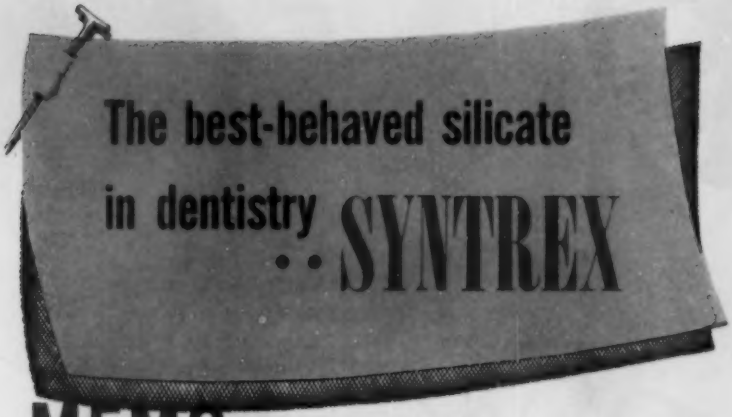

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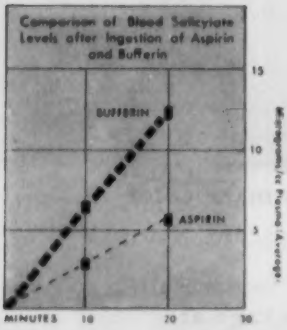

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APRIL 1954 VOLUME 48 • NUMBER 4

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The congenital cleft palate deformity

T. M. Graber, D.D.S., Ph.D., Chicago

The literature describing cleft lip and palate has been replete with discussions of etiology, hereditary predisposition, surgical and prosthetic correction and structural detail. One child in every 700 live births, 100,000 young people under 21 years of age, 10,000 children each year—the parents of these unfortunate children search eagerly every contribution to the literature in the hope of finding some way to prevent the mental anguish, the misery and the distortion of personality, the facial deformity and pathetic functional inadequacy that inevitably go with cleft lip and palate (Fig. 1). The search has not been fruitful for the countless thousands of social outcasts groping desperately for some degree of normalcy, of conformity, most of whom have had at least surgical assistance to close the cleft. Deformed noses, tightly scarred lips, mutilated palates and incoherent speech are mute testimony of the inadequacy of many past attempts at therapy.

Significantly absent from the literature for the most part has been an appreciation of the long-range nature of the problem, of the mechanism of facial growth and development, of the functional and environmental modification of therapeutic results, of the need for a broad range of professional services, if the goal of a normal adult is to be achieved.

As established in previous publications,[1-6] it appears insufficient to separate the nasal and oral cavities in an infant by closing a palatal cleft. More than this is needed if proper velopharyngeal valving

Associate professor, department of orthodontics, Northwestern University Dental School; director of research, Northwestern University Cleft Lip and Palate Institute.

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2. Graber, T. M. Craniofacial morphology in cleft palate and cleft lip deformities. Surg., Gynec. & Obst. 88:359 March 1949.

3. Graber, T. M. Cephalometric analysis of the developmental pattern and facial morphology in cleft palate. Angle Orthodont. 19:91 April 1949.

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during mastication, deglutition and speech is to be achieved. What may be a surgical success when a patient is two years of age, as judged by an esthetic and functional yardstick, may be a complete failure when the patient is 20 years old and the same yardstick is applied. It is not enough to close the lip and palate and leave the rest to nature. It is necessary to know when and where growth takes place and whether the developmental pattern for an individual with cleft palate is the same as for a normal one. Why do the results of surgery based on different principles vary so much and why do they vary in connection with the ages at which surgery is instituted? Is it possible to retard growth of the maxilla with cicatricial bands of tissue that result from surgical manipulation? Can early and repeated trauma to maxillary growth centers impair the efforts of the centers to produce a normal maxilla? How do patients with surgically repaired palates compare with patients for whom no surgery has been performed? How well can the pharyngeal constrictor complex of muscles compensate for palatal inadequacy? Contemporary opinion still differs as to what are the best methods of coping with the cleft palate problem. In a large measure this disagreement is due to the differing clinical bases of the philosophies of treatment. If the foregoing questions can be answered, a more intelligent appraisal of the various methods of rehabilitation of the individual with cleft palate can be made.

OBSERVATIONS OF CLEFT PALATE PATIENTS

For the past eight years, a continuing study of the cleft palate problem has been made at Northwestern University in its Cleft Lip and Palate Institute and at the Children's Memorial Hospital. The present report will attempt to summarize some of the observations dealing particularly with:

1. The relations and relative development of the palatal and pharyngeal musculature at birth.
2. The type and extent of the congenital clefts and the resultant tissue configuration; the frequency of the various types of clefts and the sex differences.
3. A comparison of facial proportions of the individuals with cleft palates with those of normal individuals.
4. A comparison between cleft palate patients operated on surgically and normal individuals.
5. A comparison between patients with nonpalatal clefts that have been operated on surgically and normal individuals.
6. A study of the differences that exist between patients whose palatal clefts have been surgically closed and those who have had no palatal surgery and whose palate has been left to develop with the congenital malformation still present, emphasis being placed on gross morphology and on the response of the surgically manipulated and nonoperated palates to the physiologic processes of growth, development and function.
7. The correlation of surgical timing and technics and the ultimate result.
8. The relative compensatory action of the pharyngeal constrictor complex of muscles.

The data for this study were compiled from 250 cleft lip and palate patients. One hundred and seventy-five patients form the basis of the complete statistical analysis and appraisal of craniofacial morphology.

Relations and Relative Development of Palatal and Pharyngeal Musculature at Birth • This phase of the problem required laboratory dissection. Microdissection was carried out on two stillborn males, one 5½ months premature, the other full-term. An attempt was made to explore more fully the relative development and relationships of the various muscles which carry on the functions of mastication, deglutition, respiration and

speech. The regions of particular concern were the hard and soft palate and the pharynx. It is in these regions that the surgeon and prosthetist must restore normal tissue configuration and normal function. It was not possible to dissect out individual muscles of facial expression, for these appeared immature. By contrast, both palatal and pharyngeal groups were relatively easy to discern. The palatoglossus and palatopharyngeus muscles that form the anterior and posterior pharyngeal arches could be traced from the origin to insertion. A superficial and a deep layer of the palatopharyngeus muscle were dissected, the two layers enclosing the azygos uvulae muscle and the levator palati. The deep layer blended with the dense palatine aponeurosis, which in turn was attached to the posterior margin of the horizontal palatal plates and posterior nasal spine. Levator and tensor palati muscles were as described in the various anatomy textbooks. The attachment of the tensor palati muscle to the anterolateral membranous wall of the pharyngotympanic tube was not discernible in the 5½ months' (premature) specimen, but could be picked up readily in the full-term infant.

The tendonous portion of the muscle, passing around the notch in the lateral surface of the pterygoid hamulus and fanning out in a horizontal plane, was well developed in both specimens. It would appear from the dissection of the soft palate that the tensor palati muscle has both an elevating and depressing action on the velum. The tendonous portion of the muscle as it passes around the pterygoid hamulus is superior to the insertion of the muscle. Thus it assists in raising the soft palate to the level of the hamulus, after which it acts as an antagonist for the levator muscles and makes the palate tense, as its name implies.

The pharyngeal muscles were equally well developed, with definite demarcation between longitudinal and circular muscle

Fig. 1 • Complete bilateral lip-jaw-palate cleft

fibers. Of importance, among other observations, was the existence of a definite bundle of fibers, running from the pharyngeal raphe anterolaterally to a point just medial to the most inferior aspect of the pterygoid plate, where it turned medially and forward to insert into the soft palate and palatal aponeurosis in the vicinity of the levator palati muscle. The demonstration of this specialized bundle of superior constrictor fibers in both specimens confirms the observations of Passavant,[7] Whillis and Dorrance.[8] The pharynx itself appeared as an oval-shaped tube, flattened anteroposteriorly. In the 5½ months' (premature) specimen, the width was 8 mm., the anteroposterior dimension 5 mm. In the full-term infant, the width of the pharynx was 12 mm., the anteroposterior dimension 7 mm. This is approximately one-fourth the size of an adult pharynx. De-

7. Passavant, Gustav. Ueber die Verschliessung des Schlundes beim Sprechen. Frankfort, H. Schmidt, 1863.
8. Dorrance, G. M. The operative story of cleft palate. Philadelphia, W. B. Saunders Co., 1933.

Fig. 2 • Left unilateral lip-jaw-palate, complete cleft. First palatal surgery performed when patient was five years old. Functional inadequacy because of foreshortened soft palate; however, arch form is normal

spite the maturity of contiguous bony landmarks, it is doubtful that an adult's bolus of food could be accommodated.

This series of dissections on normal specimens and subsequent dissection of stillborn infants with cleft palates provide material for an analysis of normal and abnormal function. In many surgical technics for closure of cleft palates, both palatoglossus and palatopharyngeus muscles are stretched so as to cause the anterior and posterior arches to migrate "curtainlike" toward the midline, thereby exerting a strong downward pull on the repaired soft palate (Fig. 2). Again, it has been shown that the tensor palati muscle helps in elevating the soft palate to the point where it passes around the hamular process. Many surgical technics require the fracturing of the hamular processes to relieve tension prior to staphylorrhaphy. This eliminates the elevating component of the tensor palati and throws the burden of elevation on the levator palati which is often stretched in such a way as to interfere with normal function. Further, this cannot help but endanger the mechanism of pharyngotympanic tube ventilation which is carried out by the tensor palati. The high incidence of conductive hearing loss and the frequency of middle ear infections in patients with clefts where this procedure has been followed provide a fruitful basis for further research on surgical technics. The obvious implication is that there is a need for more definitive surgery. This was supported further by the demonstration of a clear sphincteric ring of muscle fibers normally active in velopharyngeal valving. In individuals with cleft palates there is a retraction of the superior constrictor fibers to a point just medial to the pterygoid plate. No attachment can be discerned in the rudimentary palatal aponeurosis. Surgical closure seldom incorporates the constrictor fibers which lie dormant in the lateral pharyngeal wall instead of exerting a "purse-string" action in closing off the oral from the nasal cavity.

Type, Extent and Distribution of Clefts • Of the 175 patients used in the growth study, 98 were male, 77 female, 171 white, 4 colored. They ranged in age from 2 weeks to 77 years. The configuration of the deformity was variable for the sample. The anomalies ranged from clefts of the lip and alveolar process and uvula and part of the soft palate to complete bilateral clefts (Fig. 1). Diagrams of the areas of possible cleft extension are shown in Figure 3. Of the 175 studied, 37 had had no palatal surgery, 119 had palatal clefts which had been surgically repaired and 19 had clefts not involving the palate which had been surgically repaired. Table 1 shows the distribution of clefts. It is interesting to note that in the more severe categories of complete clefts—the bilateral lip-jaw-palate type, the left unilateral lip-jaw-palate type, and the right unilateral lip-jaw-palate type—the number of males was double that of females. These three categories contributed 64 per cent of the total group. In the category of less severe deformities, the female group was larger. Allowance for the limitations of sample size being made, it would seem that the majority of cases

of clefts are of the more severe and complete variety, with the male sex contributing the larger share.

Comparisons of Facial Proportions of Individuals with Cleft Palates with Normal Individuals • In the study of facial morphology, cephalometric roentgenograms served as the major basis of appraisal; however, substantial corroborative evidence came from routine plaster casts, dental roentgenograms, audiograms, speech tests, psychometric examinations and the reports of associated professional consultants. This research report is the product of united efforts in the same manner as the therapy in the Northwestern University Cleft Lip and Palate Institute is the result of an integrated treatment plan.

The Broadbent-Bolton cephalometer has been used to position the patient accurately for roentgenographic cephalometric analysis. A stereo-cephalostat has been used at Children's Memorial Hospital on infants. From 2 to 5 lateral and frontal headplates were taken of each patient at 3 to 6 months' intervals. The total number of headplates in this study exceeds 2,000.

Table 1 • Frequency of types of clefts

Type	Male	Female	Total	Per cent
Bilateral lip-jaw-palate, complete	33	15	48	27.4
Left lip-jaw-palate, complete	28	13	41	23.4
Right lip-jaw-palate, complete	14	9	23	13.1
Left lip-jaw-palate, incomplete	1		1	.5
Hard and soft palate, complete	6	11	17	9.1
Hard and soft palate, incomplete	6	12	18	10.0
Soft palate, complete		3	3	1.7
Soft palate, incomplete	1	1	2	1.1
Lip-jaw, complete	2	1	3	1.7
Lip-jaw, incomplete	4	8	12	6.8
Jaw-palate, complete	1		1	.5
Lip, complete, unilateral or bilateral	2	4	6	3.4
Total	98(56%)	77(44%)	175	

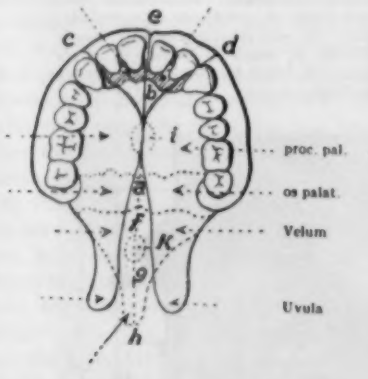


Fig. 3 • Types of palatal clefts. 1, c-b and d-b-a-f-g-h, complete bilateral cleft palate; 2, c-b or d-b-a-f-g-h, complete unilateral cleft palate; 3, e-b-a-f-g-h, complete median palatal cleft (questionable); 4, c-b or d-b, anterior or alveolar cleft; 5, c-b-a or c-b-a-f, incomplete unilateral palatal cleft; 6, b-a-f-g-h, incomplete posterior palatal cleft; 7, g-h, bifid or cleft uvula; 8, i or k, palatal perforations, usually of syphilitic origin

For the purposes of this study, certain of the more reliable criteria for determining facial characteristics were selected (Fig. 4, 5). These include anterior face height, maxillary height, interocclusal clearance, angle of facial convexity, measurements which appraise mandibular position and size, position of the maxillary first molar, position of the maxilla in the face, relation of the maxillary and mandibular incisor teeth to each other and to their respective bony bases. Some 19 different calculations were made on the measurements of each lateral headplate of each patient, or approximately 40,000 observations for the group. Measurements were well within the realm of experimental error, with a high degree of validity of the coefficients of reliability for the three most variable criteria (0.968, 0.990, 0.998).

The data (Table 2) were sorted under criterion headings and were compared with values derived by other investigators for normal individuals (patients with clinically excellent occlusion and with no

deformity).[9-22] The complete statistical analysis is on file in the department of orthodontics at Northwestern University.

Upper Face Height • Accurate measurements of upper face height were possible on 172 of the group with clefts. The range was broad, from a low of 40 per cent of total face height to a high of 51 per cent, with a mean value of 45 per cent (Fig. 4 and Table 2). This was compared with a mean of 43.95 per cent for the normal individuals. This is a significant difference of means as shown by the "t" value—above the 1 per cent level of significance. This indicates that there is less than one chance in 100 that the difference of means is due to chance. The highest percentages came from the most severe clefts and from those where surgical correction had been done at an early age.

Maxillary Height • Here again, in maxillary height, comparison of the mean values showed the maxillary height of the group with clefts to be significantly deficient when compared with that of the normal individuals. Since, in cases of cleft palate, the primary region involved is the maxilla, a deficiency in this region would result in a greater proportion of the upper face component. Such was the case.

9. Bjork, Arne. The face in profile. Lund, Berlingska Boktryckeriet, 1947.

10. Brash, J. C. The genesis and growth of deformed jaws and palates. London, Dental Board of the United Kingdom, 1924, p. 67-107.

11. Brodie, A. G. On the growth pattern of the human head from the third month to the eighth year of life. Am. J. Anat. 68:209 March 1941.

12. Broadbent, B. H. Face of the normal child. Angle Orthodont. 7:183 Oct. 1937.

13. Baldridge, J. P. A study of relation of maxillary first permanent molar to the face in Class I and Class II malocclusions. Angle Orthodont. 11:100 April 1941.

Fig. 4 • Cephalometric landmarks and measurements. S, sella turcica, roentgenographic image of the hypophysis cerebri; N, nasion, or junction of frontal and nasal bones; A, maxillary incurvation and approximate junction of basal bone and alveolar bone; B, mandibular incurvation, corresponding to point A in maxilla; P, pogonion, or most anterior point on profile curvature of chin; Gn, gnathion, or most outward and everted point on symphysis of mandible; Go, gonion, most outward and everted point on mandibular angle; 1, angle of facial convexity, N-A-P; 2, angle S-N-B; 3, angle S-N-Gn; 4, angle S-N-A; 5, angle N-S-Gn; 6, angle NS-GoGn; 7, total face height; 8, upper face height; 9, maxillary height; 10, mandibular height

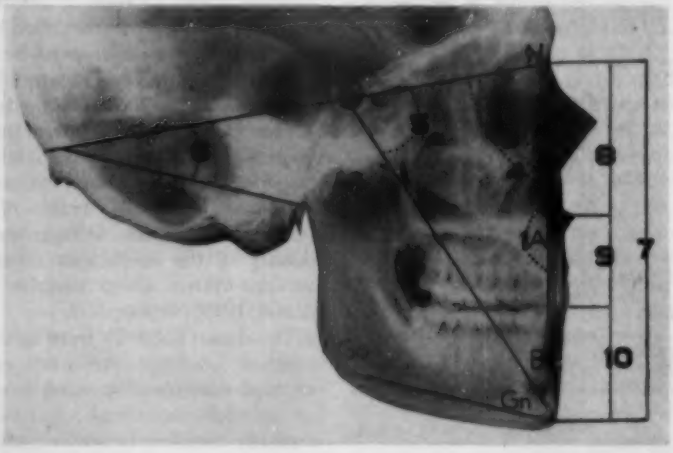
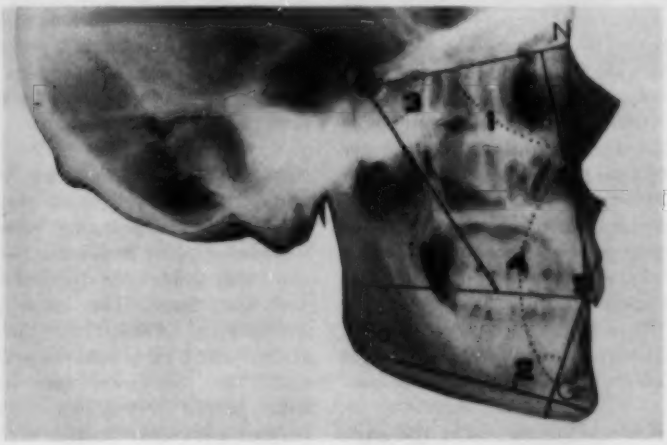


Fig. 5 • Cephalometric landmarks, dental. 1, inclination of long axis of upper incisor with NS base plane; 2, inclination of long axis of lower incisor with GoGn plane; 3, angle N-S-upper first molar; 4, angle formed by intersection of long axes of maxillary and mandibular central incisors; 5, linear measurement from incisal margin of maxillary incisor to facial or NP plane



Interocclusal Clearance (Freeway Space) • The range from 2 mm. to 21 mm. was extreme; the mean of 5.9 mm. was considerably in excess of the established mean in studies of individuals with no clefts and clinically excellent occlusions. Again, the most extreme cases—those with wide interocclusal clearance—came from the group with complete clefts that had been subjected to early surgical correction. A comparison of casts of a normal dentition with those of a cleft palate patient, with the jaws placed in physiologic rest position, is shown in Figure 6. The mandible shown on the left closes 3 mm. into occlusion, while the mandible in the cleft palate case closes 15 mm. upward and forward beyond the normal occlusal plane level because of a deficiency in maxillary height. Examples such as this were the rule rather than the exception. It would appear that, despite an apparent underdevelopment of the vertical maxillary component, the masticatory, facial and skeletal musculatures seem to have grown normally, substantiating the contention of other investigators that it is relatively easier to interfere with bone growth than with muscle growth; more explicitly, a deficiency in the accomplishment of the

14. Downs, W. Variations in facial relationships; their significance in treatment and prognosis. Am. J. Orthodont. 34:812 Oct. 1948.

15. Downs, W. Role of cephalometrics in orthodontic case analysis and diagnosis. Am. J. Orthodont. 38:162 March 1952.

16. Graber, T. M. New horizons in case analysis: clinical cephalometrics. Am. J. Orthodont. 38:603 Aug. 1952.

17. Herzberg, Fred, and Holic, R. An anthropologic study of face height. Am. J. Orthodont. & Oral Surg. 29:90 Feb. 1943.

18. Mayne, W. R. Study of the skeletal pattern of the human face. Master's thesis, Northwestern University, 1946.

19. Riedel, R. A. A cephalometric roentgenographic study of the relation of maxilla and associated parts to the cranial base in normal and malocclusion of the teeth. Master's thesis, Northwestern University, 1948.

20. Thompson, J. R. The rest position of the mandible and its significance to dental science. J.A.D.A. 33:151 Feb. 1946.

21. Thompson, J. R. The oral and environmental factors as etiologic factors in malocclusion of the teeth. Am. J. Orthodont. 35:33 Jan. 1949.

22. Younger, W. A roentgenographic cephalometric appraisal of facial pattern in Class II, Division I malocclusion. Master's thesis, Northwestern University, 1949.

23. Toothaker, J. C. Study of the angle of axial inclination between the teeth and their bony bases. Master's thesis, Northwestern University, 1946.

pattern of bone growth does not mean a corresponding underdevelopment of the draping and motivating musculature.

Angle of Convexity (NAP) • It was possible to measure accurately the angle of convexity on 161 patients. The range was extremely wide (minus 50 degrees to plus 29 degrees). Because of the wide standard deviation, the mean measurement of minus 2.34 degrees, indicating a concave profile, had no particular significance for the group as a whole. Infants with clefts that had not been operated on had the most convex profiles. The most concave profiles characterized the patients with complete clefts that had been treated by surgery. In most instances these patients also had deficiencies in maxillary height and an excessive interocclusal clearance.

Angle SNA • Measurement of the angle SNA (Fig. 4) is one means of appraising anteroposterior growth of the maxilla. One hundred and seventy-four patients were measured. The range was wide, from 52 degrees to 95 degrees. The mean was 75.48 degrees as compared with 82.01 degrees in normal individuals. That this apparently significant difference of means is real can be seen in Table 2 which shows a "t" value of 6.40. This value is considerably above the 1 per cent level and accords with the negative angle of convexity. It indicates the specific anteroposterior maxillary deficiency.

Angle SNB • Just as point A (Fig. 4) signifies the approximate junction of alveolar and supporting bone in the maxilla, so point B signifies the mandibular incurvation—the division of alveolar and basal bone. The mean difference from normal (Table 2) indicates that the mandibular base is also posterior to normal. The impression may be gained, when judged by this one criterion, that persons with cleft palates are prone to mandibular as well as maxillary retrusions.

Angle NS-GoGn • Whereas the angle SNB is used as a means of determining

Table 2 • Comparison of the means for the entire group with clefts with the means for normal group

Criterion	Present study	S.D.	Normal group	S.D.	"t" value	Level of significance
Upper face height	45.02%	3.05	43.95%	2.40	2.28	high 1%
Maxillary height	40.27%	3.50	41.66%	2.08	2.67	high 1%
Interocclusal clearance	5.98mm.	3.52	3.00mm.			
Angle N-A-P	-2.34°	14.11	1.62°	4.78	1.95	good 5%
Angle S-N-A	75.48°	6.86	82.01°	3.89	6.40	very high 1%
Angle S-N-B	75.30°	4.47	79.97°	3.60	6.72	very high 1%
Difference between S-N-A and S-N-B angles	-0.06°	6.46	2.04°			
Angle N-S-upper first molar	69.83°	3.72	65.85°	3.56	6.45	very high 1%
Angle NS-GoGn	38.31°	6.37	31.71°	5.19	6.67	very high 1%
Angle S-N-Gn	74.76°	4.34	79.29°	3.39	6.75	very high 1%
Angle N-S-Gn	71.01°	4.51	67.05°	3.85	5.58	very high 1%
Lower incisor to GoGn plane	83.19°	8.64	91.92°	7.60	6.46	very high 1%
Upper incisor to NS plane	82.47°	16.06	103.97°	5.75	9.24	very high 1%
Upper to lower incisor	154.57°	20.72	130.98°	9.24	7.78	very high 1%
Upper incisor to NP plane	-0.667mm.	6.64	5.51mm.	3.15	6.30	very high 1%
Contour of nasopharynx	2.89	1.39	1.0*			
Velopharyngeal closure	2.21	.904	4.0†			

*An arbitrary designation for clear nasopharynx.
†An arbitrary designation of good velopharyngeal closure.

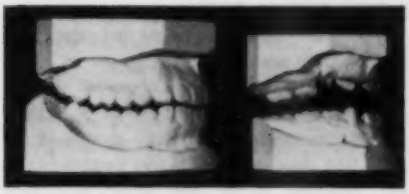


Fig. 6 • Casts at left are of patient with normal occlusion; casts at right are of patient with cleft palate, both casts in physiologic rest position. Interocclusal clearance in casts on left is 3 mm.; in casts on right, 15 mm.

the anteroposterior basal relationship in the mandible, the angle NS-GoGn measures the angulation of the body of the mandible, as compared with the cranial base. A decidedly more obtuse mandibular angle was found in persons with cleft palate than in normal individuals. The 6.67 degrees difference is statistically significant at a very high level, much higher than the 1 per cent level. Some observers would interpret this as an indication of underdevelopment of the ramus or, more particularly, of insufficient condylar growth. This interpretation would substantiate the impression of anteroposterior deficiency. The patients who had been operated on, as well as those who had not, showed this tendency. Why a growth disturbance in the mandible should be coupled with a congenital cleft of the maxilla is not readily apparent.

Angle S-N-Gn • The measurement of the angle S-N-Gn supplements the angle SNB measurement in the appraisal of anteroposterior facial dysplasia, particularly in the establishment of the relation of the symphysis or chinpoint to the facial profile. In 157 cases, where accurate measurements were possible, a calculated mean of 74.75 degrees was derived, as compared to an arithmetic mean of 79.29 degrees for individuals with clinically excellent occlusion. The "t" value again was very high (Table 2) making the mean statistically significant. The assumption is valid that the chinpoint occupied a retruded position in the facial profile, if the measurements pointing to inadequate ramus height and retrusion of the mandibular incurvation are reliable. This retrusion existed in spite of the fact that the excessive interocclusal clearance in many cases, coupled with a deficiency in maxillary height, allowed the chinpoint to swing upward and forward beyond where it normally should, propelling point B and gnathion further forward and reducing the inclination of the inferior mandibular border.

Angle N-S-Gn • The angle N-S-Gn is also a supplemental measurement for determining the anteroposterior position of the chinpoint. As was expected, measurements established the chinpoint in a more posterior position with reference to the NS cranial plane.

ADDITIONAL MEASUREMENTS

The primarily dental measurements included the position of the maxillary first molar, inclination of upper and lower incisors as related to base planes and to each other, and relation of the maxillary incisor to the facial plane.

Angle N-S-Upper First Molar • Because of the frequency of jumbled teeth in the maxillas of individuals with cleft palate, the angle N-S-upper first molar measurement was subject to more error, and only 120 cases could be considered at all reliable. The distribution curve closely paralleled that for a normal group, however, and the standard deviation was relatively low. A comparison of the cleft palate patients with the normal indi-

viduals indicated a strong tendency toward posterior positioning of the first molar, with less than one chance in 1,000 that the difference was due to chance (Table 2). This fact means not only that the anteroposterior facial dysplasia is manifest, but also that the teeth within the maxilla show the same posterior placement. Since the maxilla is retarded in its downward and forward growth, the first molar, the most stable tooth in the maxillary arch (Angle,[24] Brodie,[25] Baldridge[13]), naturally would be in a more posterior position.

Angle of Lower Incisor to Mandibular Plane • Numerous investigators have demonstrated the relative constancy of the inclination of the long axis of the lower incisor with reference to the lower mandibular border, or Go-Gn plane. In the studies of normal individuals, the values approach 90 degrees. In the group with cleft palates, however, the calculated mean was 83.19 degrees (Table 2). Despite a broad range (65 degrees to 104 degrees) the difference has high significance. This lingual inclination of the mandibular incisors was definitely greater in the more severe cases and in those cases where the maxilla showed the greatest anteroposterior deficiency. Also, where lip repairs had been done that produced a tight constricting band of scar tissue, the lower incisors tipped more to the lingual. It has been emphasized repeatedly by orthodontists that the teeth are sensitive and responsive to environmental muscular forces. The findings in this study furnish additional evidence in that direction.

Angle of the Upper Central Incisor to the NS Plane • The maxillary incisors are just as responsive to environmental stimuli as the mandibular incisors. Studies of normal persons indicated that the maxillary incisor inclination is relatively constant in relation to the maxillary plane at the floor of the nose or to the NS cranial plane. The group with cleft palates showed an extremely wide range in this criterion (from 28 degrees to 116 degrees). Despite the large standard deviation of 16.06 degrees, the large difference of means of over 21 degrees produced the most significant "t" ratio of 9.24 (Table 2). The morphological disturbances in the cleft region and in tissues immediately contiguous to the cleft had a bizarre effect on incisor tooth position in many cases. The teeth nearest the area of deformation naturally reflected the disturbance most. As with the lower incisors, the teeth most lingually inclined were in the individuals with severe clefts, with rotated premaxillas and tight and unyielding lip repairs.

Angle of the Lower Incisor to the Upper Incisor • This angular measurement (the lower incisor to the upper incisor) is within the immediate environs of the congenital cleft region and reflected in the group with cleft palates the lingual inclination of both upper and lower incisor teeth. In 130 cases, the angular values had a wide spread of from 108 degrees to 230 degrees with a mean of 154.57 degrees. Despite the large standard deviation of 20.72 degrees, the obvious difference of means was exceeded in significance only by the inclination of the upper incisor to the NS plane (Table 2).

Upper Incisor to the Facial (NP) Plane • The position of the upper incisor teeth has a good deal to do with the profile contour of the lower part of the face. When the incisors are tipped too far forward, there is a fullness or protrusion of the lip and a convex profile. In individuals with clinically excellent occlusions, the incisal margin of the maxillary central incisor lies about 5.5 mm. anterior to a

24. Angle, E. H, Treatment of malocclusion of the teeth, ed. 7. Philadelphia, S. S. White Co., 1907.

25. Brodie, A. G., and others. Cephalometric appraisal of orthodontic results. Angle Orthodont. 8:261 Oct. 1938.

line joining the anthropometric landmarks of nasion and pogonion (Fig. 5). In the present study of individuals with cleft palates, the incisal margin varied from 27 mm. behind the NP plane to 13 mm. anterior to the plane. Despite this wide range, the resultant average concave profile agreed with other values that had already placed the maxilla itself in a position posterior to normal.

Contour of the Upper Lip • Appraisal of the contour of the upper lip was not cephalometric but was made by visual observation and digital manipulation of the part in question. Those cases where the cleft lip had been closed by surgery were arbitrarily classified as "tight," "loose" or "full" on the basis of the judgment of the investigator. In 133 cases involving lip repairs, 59 were tight, 50 were loose, and in 24 cases the lip was full and the contour relatively normal. It was observed that the greatest lingual inclination of teeth in the anterior segments was seen in the group with "tight" lip repairs. The bilateral cleft lips proved the greatest problem and showed the tightest contours.

Contour of the Nasopharynx • Here again, the recorded appraisal of the contour of the nasopharynx was based primarily on the investigator's judgment, the basis of study being the lateral cephalometric roentgenogram. It has been observed by other investigators that there is often a proliferation of tonsillar tissue in the epipharyngeal regions which is of a hypertrophic character when compared with normal tissue. In the present study, the sample was broken down into groups according to the extent to which the nasopharynx was occluded. The classes "clear," "slightly occluded," "partly occluded" and "heavily occluded" were assigned values of 1, 2, 3 and 4 respectively so as to allow a statistical analysis. The mean of 2.89 (Table 2) would seem to show that the average for the cleft palate group was between "slightly" and "partly" occluded. It was observed that the greatest amount of nasopharyngeal occlusion came in the 2 to 10 year old groups. Newborn infants and adults showed relatively little hypertrophy of tonsillar tissue. Only limited value can be attached to this phase of the problem inasmuch as many of the patients had undergone tonsillectomies which would change the contour of the posterior pharyngeal wall.

Velopharyngeal Closure • Review of pertinent literature has shown that the primary aim of rehabilitation of the individual with cleft palate is restoration of articulate speech. Good speech depends on effective velopharyngeal closure. The typical nasal twang in the speech of persons with a cleft palate is due to the inability of the individual to close off the mouth from the nasal cavity. As in the appraisal of the nasopharyngeal contour, arbitrary divisions were made according to the degree of pharyngeal closure as follows: "normal," no involvement of the soft palate; "none," unoperated clefts; "poor"; "fair"; good." The last four categories were assigned values of 1, 2, 3 and 4 and worked up statistically. The central tendency was between "poor" and "fair." In 113 cases involving the soft palate where surgical repair had been attempted, 43 were judged under the heading of "poor" velopharyngeal closure, 63 as "fair" and only 7 as "good." This would seem to be an indictment of the present methods of rehabilitation. It at least demonstrates inadequacies when it comes to the restoration of normal velopharyngeal closure and speech.

COMPARISON OF GROUPS

Comparison of Group with Palatal Clefts Operated On with Normal Individuals • In comparing the entire group with cleft palates with the normal group, it was seen that the greatest deviation from the normal came in the group with severe

Table 3 • Comparison of means for group with operated cleft palates and means for normal group

Criterion	Present study	S.D.	Normal group	S.D.	"t" value	Level of significance
Upper face height	45.63%	3.25	43.95%	2.40	3.29	very high 1%
Maxillary height	39.55%	3.54	41.66%	2.08	3.92	very high 1%
Interocclusal clearance	6.84mm.	3.90	3.00mm.			
Angle N-A-P	-5.44°	14.46	1.62°	4.78	3.37	very high 1%
Angle S-N-A	73.17°	5.92	82.01°	3.89	9.72	very high 1%
Angle S-N-B	74.72°	4.45	79.97°	3.60	7.35	very high 1%
Difference between S-N-A and S-N-B	-1.64°	6.61	2.04°			
Angle N-S-upper first molar	70.23°	6.63	65.85°	3.56	4.34	very high 1%
Angle NS-GoGn	39.27°	3.79	31.71°	5.19	10.50	very high 1%
Angle S-N-Gn	74.25°	4.31	79.29°	3.39	7.35	very high 1%
Angle N-S-Gn	71.50°	4.69	67.05°	3.85	5.91	very high 1%
Lower incisor to GoGn plane	81.70°	8.72	91.92°	7.60	7.18	very high 1%
Upper incisor to NS plane	81.38°	16.70	103.97°	5.75	9.31	very high 1%
Upper to lower incisor	151.98°	34.20	130.98°	9.24	4.26	very high 1%
Upper incisor to NP plane	-2.03mm.	6.65	5.51mm.	3.15	7.61	very high 1%

clefts that had been surgically corrected. The minor clefts and unoperated clefts were concentrated at the normal end of the range. The 119 cases that had been surgically operated on were compared with the normal individuals (Table 3).

The upper face height of these patients was slightly greater than that of the entire cleft palate group and still greater than that of normal individuals. There was greater vertical deficiency in maxillary height in the group where the cleft had been surgically corrected (Table 3).

Fig. 7 • Tracing of lateral headplate of 17 year old patient with cleft palate. Note concave profile and 17 mm. interocclusal clearance. When patient was six months old, palate was surgically closed by Brophy technic

The interocclusal clearance measurement reflected the greater maxillary height deficiency and was significantly greater. Figure 7 shows an instance where the palatal cleft was closed in one operation before the patient was six months of age. The facial pattern is at the extreme end of the range of deformity. The 17 mm. interocclusal clearance is only part of the difficulty.

The group with cleft palates that had been surgically corrected evidenced not only greater vertical deficiency but also increased anteroposterior discrepancy. The measurements of the angle of facial convexity and the angle SNA emphasize this (Table 3). The apical base difference was greater and the upper first molar was more posterior in persons who had surgically corrected clefts. The measurements of the mandible for this group were not significantly different from those of the entire group with clefts; there was the same increased inclination of the inferior mandibular border. The lower incisors, however, had a greater lingual

Table 4 • Comparison of means for group with cleft palates operated on before six months of age and means for normal group

Criterion	Present study	S.D.	Normal group	S.D.	"t" value	Level of significance
Upper face height	46.88%	3.34	43.95%	2.40	4.89	very high 1%
Maxillary height	37.62%	4.14	41.66%	2.08	6.06	very high 1%
Interocclusal clearance	9.39mm.	4.88	3.00mm.			
Angle N-A-P	-17.23°	15.03	1.62°	4.78	8.39	very high 1%
Angle S-N-A	69.51°	7.41	82.01°	3.89	10.36	very high 1%
Angle S-N-B	76.44°	4.09	79.97°	3.60	4.41	very high 1%
Difference between S-N-A and S-N-B	-7.05°	7.01	2.04°			
Angle N-S-upper first molar	70.10°	9.57	65.85°	3.56	2.89	high 1%
Angle NS-GoGn	36.71°	6.48	31.71°	5.19	4.09	very high 1%
Angle S-N-Gn	76.31°	3.88	79.29°	3.39	3.87	very high 1%
Angle N-S-Gn	69.71°	4.50	67.05°	3.85	3.48	very high 1%
Lower incisor to GoGn plane	78.17°	8.41	91.92°	7.60	8.14	very high 1%
Upper incisor to NS plane	79.06°	20.09	103.97°	5.75	8.29	very high 1%
Upper to lower incisor	165.34°	26.57	130.98°	9.24	8.42	very high 1%
Upper incisor to NP plane	-7.0mm.	7.30	5.51mm.	3.15	10.67	very high 1%

slant, with a mean of 81.70 degrees as compared with 83.19 degrees for the entire group with clefts and 91.92 degrees for a representative normal group. The maxillary incisors showed increased lingual inclination and positioning in relation to the NP or facial plane.

With the exception of the inclination of the upper to the lower incisor, the group with surgically corrected cleft palates showed a tendency away from the normal as judged by every criterion. Even within this group, however, certain cases that had been operated on had better or poorer facial patterns. The patients who had had early surgical treatment often showed the most extreme deviation from the normal means. Because of the importance of the age of the patient at time of operation, the group that had been operated on was broken down into five categories: those operated on before the age of six months; those operated on between the ages of 6 and 18 months; those aged 18 to 30 months at time of operation; those aged 4 to 5 years, and those operated on after 5 years of age (Tables 3 and 4).

By far the greatest deviations were noted in the 43 cases where there had been palatal closure prior to the age of six months (Table 4). Extreme maxillary deformity appeared consistently. Figure 8 is a tracing which indicates the type of deformity that occurred. The palate of the child had been closed by a Brophy compression type operation when the patient was three months old. His maxillary height at 12 years of age was 34 per

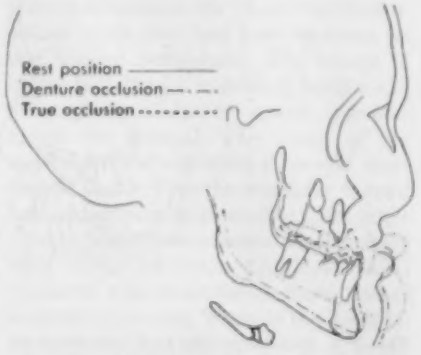


Fig. 8 • Cephalometric tracing showing rest vertical, denture vertical (restored vertical) and true occlusal vertical dimensions (overclosure)

cent of total lower face height, intermaxillary clearance 16 mm.; the maxilla was retruded; the incisors were lingually inclined. In this type of case there is reason to believe that the deformity is progressive with age. An example of such progression is shown in Figure 9. The patient was operated on early, and development was followed for five years (Table 5). The maxillary height decreased from 40 per cent to 38 per cent, the upper face height increased from 47 to 50 per cent, the convexity of the profile increased, the maxilla and maxillary in-

Fig. 9 • Above left: Surgical correction by early osteouranoplasty (pressure type) technic. Note wide functional range. Solid outline, mandible in physiologic rest position; dotted outline, teeth in occlusion. Above right: Same case as at left, one year later. Interocclusal clearance has increased, which allows chinpoint to swing upward and forward. Below left: Further increase of 2 mm. in interocclusal clearance has accentuated prognathism and introduced functional disturbances. Below right: Patient now closes 21 mm. from rest to occlusion. Maxillary teeth apparently remain static in face that is growing downward and forward

Table 5 • Cephalometric and clinical analysis of girl with complete bilateral lip-jaw-palate cleft. Surgical closure of palatal cleft by Brophy osteouranoplasty. Four operations performed when patient was 6 months, 8 months, 13 months and 30 months of age. Two revisions at 4½ years and 5 years

Criterion	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.
Upper face height	47%	47%	49%	49%	50%
Maxillary height	40%	39%	39%	38%	38%
Interocclusal clearance	17mm.	18mm.	19mm.	21mm.	21mm.
Angle N-A-P	-32°	-32°	-33°	-34°	-35°
Angle S-N-A	69°	68°	68°	66°	66°
Angle S-N-B	75°	74°	74°	74°	74°
S-N-A-S-N-B difference	6°	6°	6°	8°	8°
N-S-upper first molar	65°	64°	64°	65°	65°
NS-GoGn	31°	29°	28°	28°	27°
S-N-Gn	75°	74°	75°	75°	74°
N-S-Gn	75°	75°	74°	73°	74°
Upper incisor to NS plane	30°	30°	29°	28°	28°
Lower incisor to GoGn plane	78°	76°	75°	73°	72°
Upper to lower incisor	221°	222°	227°	229°	230°
Upper incisor to NP plane	-15mm.	-15mm.	-16mm.	-17mm.	-17mm.
Nasopharynx	Partly occluded				
Velopharyngeal closure	Poor				
Lip contour	Tight				

cisors became more retropositioned. The soft tissue draping particularly emphasized the bony deficiency.

In the 43 cases where the palate had been closed before the patients were six months of age, the mandible showed slightly less posterior positioning with the teeth in occlusion than was shown in the entire group with clefts. This may be explained by the fact that the acute lack of vertical height caused the mandible in occluding to swing upward and forward into overclosure. Thus the mandibular overclosure effected a pseudoprognathism, not validated by morphologic appraisal.

Again it was found that in the group where surgery had been performed early, there was marked lingual inclination of the upper and lower incisors, and there was an even greater departure from the normal.

Table 6 • Comparison of means for group with operated nonpalatal clefts and means for normal group

Criterion	Present study	S.D.	Normal group	S.D.
Upper face height	43.06%	1.76	43.95%	2.40
Maxillary height	42.38%	2.85	41.66%	2.08
Interocclusal clearance	4.11mm.	1.60	3.00mm.	
Angle N-A-P	5.88°	9.86	1.62°	4.78
Angle S-N-A	80.06°	4.16	82.01°	3.89
Angle S-N-B	78.51°	3.17	79.97°	3.60
Difference between S-N-A and S-N-B	4.06°	3.51	2.04°	
Angle N-S-upper first molar	68.00°	3.46	65.85°	3.56
Angle NS-GoGn	35.38°	4.56	31.71°	5.19
Angle S-N-Gn	74.80°	3.09	79.29°	3.39
Angle N-S-Gn	70.40°	2.30	67.05°	3.85
Lower incisor to GoGn plane	88.82°	8.57	91.92°	7.60
Upper incisor to NS plane	83.75°	16.30	103.97°	5.75
Upper to lower incisor	149.14°	20.50	130.98°	9.24
Upper incisor to NP plane	1.78mm.	4.14	5.51mm.	3.15

In the groups operated on at ages 6 to 18 months, 18 to 30 months, 4 to 5 years and after 5 years, a progressive trend toward normal values was noted in criteria assessing craniofacial morphology.

Comparison of Group with Nonpalatal Clefts Operated On with Normal Groups • In order to see if there was any difference in facial pattern where there was no palatal involvement, a comparison was made between the 18 cases with nonpalatal clefts that had been operated on and normal individuals. The means of upper face height, maxillary height and interocclusal clearance closely approximated the normal. The mean of the angles of facial convexity showed a more convex profile than the mean for normal individuals despite a smaller SNA angle (Table 6). Measurements of the mandible (SNB, NS-GoGn, SNGN, N-S-Gn) indicated a more consistent trend toward underdevelopment. Whereas the lower incisor inclination more nearly approximated the normal, yet the maxillary incisor, because of its proximity to the cleft area, showed considerable lingual inclination.

Table 7 • Comparison of means for group with nonoperated cleft palates and means for normal group

Criterion	Present study	S.D.	Normal group	S.D.
Upper face height	43.81%	1.82	43.95%	2.40
Maxillary height	41.86%	1.99	41.66%	2.08
Interocclusal clearance	4.08mm.	.96	3.00mm.	
Angle N-A-P	6.74°	7.72	1.62°	4.78
Angle S-N-A	80.78°	4.72	82.01°	3.89
Angle S-N-B	77.39°	4.63	79.97°	3.60
Difference between S-N-A and S-N-B	4.25°	2.95	2.04°	
Angle N-S-upper first molar	68.60°	3.03	65.85°	3.56
Angle NS-GoGn	35.62°	4.50	31.71°	5.19
Angle S-N-Gn	77.04°	4.62	79.29°	3.39
Angle N-S-Gn	69.20°	3.32	67.05°	3.85
Lower incisor to GoGn plane	85.61°	6.84	91.92°	7.60
Upper incisor to NS plane	85.37°	13.90	103.97°	5.75
Upper to lower incisor	147.83°	15.11	130.98°	9.24
Upper incisor to NP plane	5.10mm.	3.37	5.51mm.	3.15

Comparison of Nonoperated Cleft Cases with Normal Cases and with Cleft Cases that Had Been Surgically Corrected • A total of 37 patients had had no palatal surgery. Some had had lip closures; others had had no surgery. Table 7 shows a comparison between means of the group with nonoperated cleft palates and means of the normal groups. It is immediately apparent that the means of the group with nonoperated clefts and of the group with operated nonpalatal defects most closely approximate the normal. Facial height measurements and maxillary height in particular are almost identical. While facial height percentages were normal for the group with nonoperated clefts, the mean facial proportions of the group with cleft palates that had been operated on, especially the group that had had early surgical correction, showed significant deficiencies in maxillary growth.

The intermaxillary clearance was almost the same for the group with nonoperated clefts as for the group with operated nonpalatal clefts (4.08 mm.). While slightly greater than the normal measurement, it was less than half that of the clearance of the cases that had been handled surgically before the patients were six months old.

The angle of facial convexity was 6.74 degrees, or more than the normal derived by Riedel[19] in his study. There were, however, a number of newborn infants in this group. It is known that their profile is more convex normally than it is in later life. Since none of the studies on normal individuals has included infants, it may well be that the normal mean would be scaled more toward the convex figure if they had been included. In any event, the typical dished-in concave profile of the patient with an operated cleft palate is a trend in the opposite direction.

The SNA angle and the N-S-upper first molar angles indicated slight tendencies toward retropositioning, but these tendencies were totally insignificant when compared with those of the operated groups.

All measurements assessing the mandible showed the same tendency as the entire group with clefts. The inclination of the lower border was greater, the chin-point more posterior in the profile. This would seem to indicate that, regardless of environmental factors, the tendency toward mandibular underdevelopment is definite in individuals with cleft palates.

In the group with nonoperated clefts, the inclination of both upper and lower incisors was definitely more upright than in the normal group (Table 7). The mean of 85.61 degrees for the lower incisor is one standard deviation below the normal mean. The possible explanation for part of this might be the inclusion of cases where the lips had been surgically closed but the palates were still left open. These cases presented the most marked lingual inclination of upper and lower incisors. The lingually inclined maxillary incisors undoubtedly reflected their contiguity with the cleft area.

The comparison between the mean of the group with nonoperated clefts and

that of the normal group seems to show a much closer relationship. Despite the tendency toward mandibular underdevelopment and local tipping of teeth, the anteroposterior and vertical growth components seem to be within normal limits, which certainly cannot be said for the persons with operated cleft palates. In the group that had had early surgical correction, the greatest departure from the normal appeared in maxillary vertical and anteroposterior dimensions. The noticeable lateral constriction of the maxillary arch, so often seen in the individual with an operated cleft palate, did not appear in the nonoperated group (Fig. 10). Figure 11 compares the unoperated complete bilateral lip-jaw-palate cleft of a young negro adult with that of an 11 year old boy who had had 15 operations to close the same type of cleft. Figure 12 offers graphic evidence of the morphologic differences between the operated and the unoperated palates. In order to test the validity of the apparent differences in facial pattern between individuals with operated clefts and those with unoperated clefts, tests of significance were run on each criterion (Table 8). The major differences in all general facial criteria are obvious and emphasize the anteroposterior deficiencies in the group that had been operated on as opposed to those without operation.

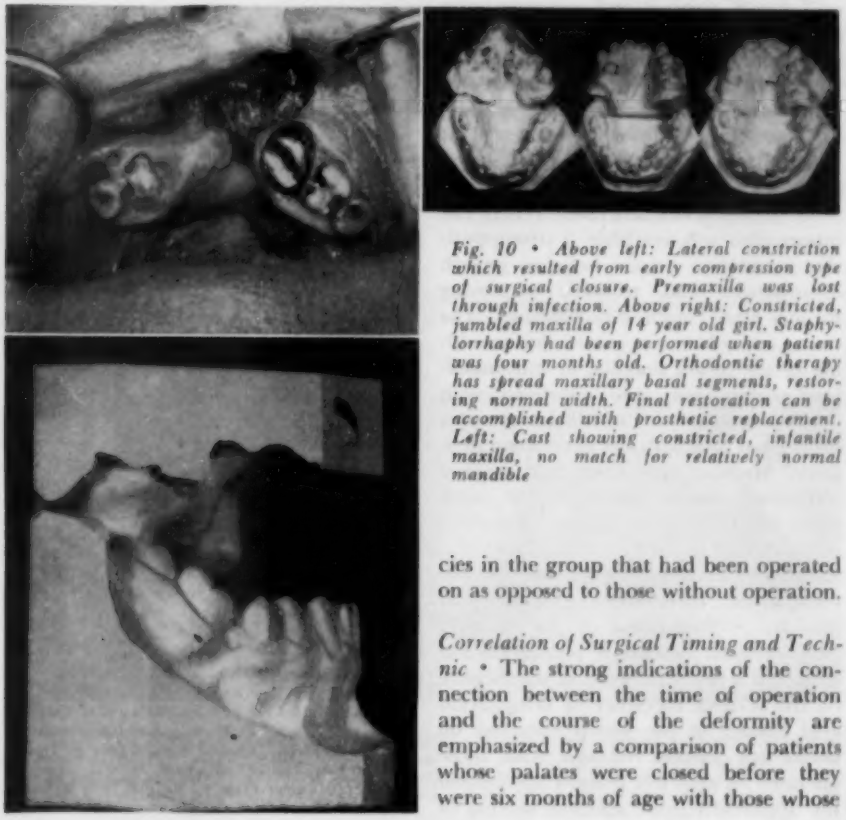


Fig. 10 • Above left: Lateral constriction which resulted from early compression type of surgical closure. Premaxilla was lost through infection. Above right: Constricted, jumbled maxilla of 14 year old girl. Staphylorrhaphy had been performed when patient was four months old. Orthodontic therapy has spread maxillary basal segments, restoring normal width. Final restoration can be accomplished with prosthetic replacement. Left: Cast showing constricted, infantile maxilla, no match for relatively normal mandible

Correlation of Surgical Timing and Technic • The strong indications of the connection between the time of operation and the course of the deformity are emphasized by a comparison of patients whose palates were closed before they were six months of age with those whose

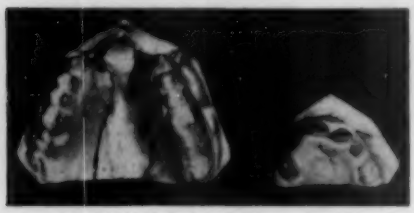


Fig. 11 • Occlusal view at left of nonoperated complete lip-jaw-palate cleft; at right, operated complete lip-jaw-palate cleft. Palate is unyielding fibrous diaphragm

palates were surgically closed after the patient was 2½ years old. Again, the greatest facial deformity is associated with early surgical intervention. As seen in Table 9, vertical and anteroposterior dimensions differed most significantly. Undoubtedly the contour of the maxillary arch was more normal in patients whose palates were closed after the patient was four years of age (Fig. 2). It was difficult to get accurate details regarding the surgical technic which had been employed in many cases. Where this information was available, a strong positive correlation existed between growth disturbances and technics employing Brophy type compression closures. The strong impression was gained that moulding of the infant maxilla, or intramaxillary wiring, not only interfered with development of the maxillary complex proper but also with the developing dentition. Multiple operations that involved soft-tissue closure produced the same effect only to a lesser degree (Fig. 13).

Relative Compensatory Action of the Pharyngeal Constrictor Complex of Muscles • Regardless of the surgical technics used, functional restoration has remained a problem. Tests of significance on the relative efficiency of velopharyngeal closure in the group operated on before six months of age with those operated on after five years of age showed the apparently more efficient valving of the latter group to be statistically significant at the 5 per cent level. Though the functional adequacy was better in the group operated on at the later ages, it was still a long way from ample. It has already been pointed out that the superior constrictor muscle contributes fibers to the palatine aponeurosis, giving a modified sphincteric action in velopharyngeal valving. A congenital cleft palate interferes with this "purse-string" action, and it is debatable whether suturing soft tissue flaps together in the midline can restore this activity sufficiently to allow complete closure. Williams[26] demonstrated that the contribu-

26. Williams, Robert. A radiographic cephalometric study of velopharyngeal valving during function. Master's thesis, Northwestern University, 1952.

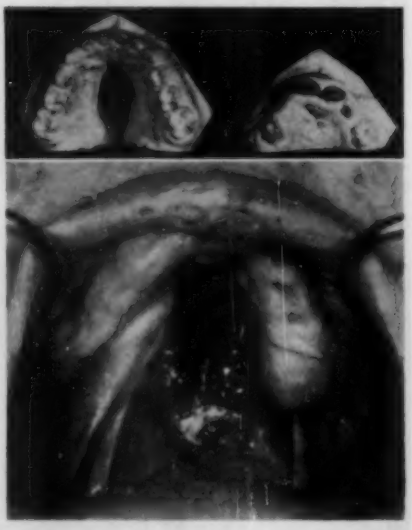


Fig. 12 • Above: Occlusal views of cast of unoperated cleft palate at left; cast of 14 year old boy at right. Palate was closed when patient was three months old and maintained that way with help of 14 subsequent surgical revisions. Below: Left unilateral lip-jaw-palate cleft, complete. Lip had been closed early but palate was untouched. Note normal development. Obturator restored normal function and esthetics

Table 8 • Comparison of means for groups with operated and nonoperated cleft palates

Criterion	Operated	S.D.	Nonoperated	S.D.	"t" value	Level of significance
Upper face height	45.63%	3.25	43.81%	1.82	3.18	high 1%
Maxillary height	39.55%	3.54	41.86%	1.99	3.67	high 1%
Interocclusal clearance	6.84mm.	3.90	4.08mm.	.96	4.24	very high 1%
Angle N-A-P	-5.44°	14.46	6.74°	7.72	4.24	very high 1%
Angle S-N-A	73.17°	5.92	80.78°	4.72	7.73	very high 1%
Angle S-N-B	74.72°	4.45	77.39°	4.63	2.85	high 1%
Difference between S-N-A and S-N-B	-1.64°	6.61	4.25°	2.95	4.53	very high 1%
Angle N-S-upper first molar	70.23°	6.63	68.60°	3.03	.772	none
Angle Ns-GoGn	39.27°	3.79	35.42°	4.50	2.65	high 1%
Angle S-N-Gn	74.25°	4.31	77.04°	4.62	2.90	high 1%
Angle N-S-Gn	71.50°	4.69	69.20°	3.32	2.63	high 1%
Lower incisor to GoGn plane	81.70°	8.72	85.61°	6.84	2.37	good 2%
Upper incisor to NS plane	81.38°	16.70	85.37°	13.90	1.19	none
Upper to lower incisor	151.98°	34.20	147.83°	15.11	.506	none
Upper incisor to NP plane	-2.03mm.	6.65	5.10mm.	3.37	4.52	very high 1%
Velopharyngeal closure	2.58	.678	1.08	.401	28.60	very high 1%
Contour of nasopharynx	2.70	1.29	3.30	.94	2.66	high 1%

tion of the posterior wall of the pharynx to velopharyngeal valving was not measurable in certain speech sounds in normal individuals. Carpenter[27] has shown in a like sample of patients with cleft palates that the compensatory action of the posterior wall of the pharynx, particularly Passavant's pad, is definitely greater. In routine oral examination in our study, when the gag reflex was elicited in patients with clefts, the pharyngeal musculature either appeared hyperactive or seemed responsive to training with limited myofunctional therapy in conjunction with speech training. It is unlikely, however, that even the greatest

27. Carpenter, C. Unpublished research, Northwestern University, 1953.

Fig. 13 • Left: Complete unilateral cleft, surgically closed at six months by staphylorrhaphy. Subsequent revision when patient was two, four and five years old. Velopharyngeal valving totally inadequate despite relatively little growth interference. Right: Palatal scar tissue and malposed remaining teeth make prosthetic restoration for proper function and esthetics difficult

Table 9 • Comparison of means for patients whose palates were surgically closed before six months and after two and a half years of age (2½ -5 years)

Criterion	Before 6 months	After 2½ years	"t" value	Level of significance
Angle N-A-P	-17.23°	5.77°	5.41	very high 1%
Difference between angles S-N-A and S-N-B	-7.05°	3.38°	5.29	very high 1%
Interocclusal clearance	9.39mm.	4.30mm.	4.34	very high 1%
Angle S-N-A	69.51°	76.23°	4.29	very high 1%
Upper incisor to NP plane	-7.00mm.	-.58mm.	3.92	very high 1%
Lower incisor to GoGn plane	78.17°	82.83°	3.23	high 1%
Maxillary height	37.62%	40.54%	3.05	high 1%
Upper face height	46.88%	44.85%	2.19	good 5%
Velopharyngeal closure	2.29	2.69	2.07	good 5%
Upper to lower incisor	145.34°	153.17°	2.02	good 5%
Angle S-N-Gn	76.31°	71.92°	1.77	insignificant
Angle N-S-Gn	69.71°	73.54°	1.57	insignificant
Angle NS-GoGn	36.71°	42.62°	1.07	insignificant
Angle S-N-B	76.44°	72.85°	1.05	insignificant
Upper incisor to NS plane	79.06°	78.00°	.79	none
Contour of nasopharynx	2.86	2.85	.79	none
N-S-upper first molar	70.10°	70.90°	.11	none

compensatory pharyngeal movement can make up for a foreshortened palate. Long-term studies show that cleft palate individuals who had intelligible speech at 4 to 6 years of age often find increased difficulty in enunciating clearly and in closing off the nose from the mouth as they grow older. The reason is two-fold. The hyperplastic tonsillar and adenoid masses, which aid in closure in early years, either become diseased and have to be removed or shrink spontaneously. Secondly, the repaired palate does not grow at the same rate as a normal palate. Thus, as the posterior pharyngeal wall grows downward and backward, space opens up between the pharyngeal wall and the soft palate. The tensor palati muscle seldom functions normally in a repaired cleft palate. The elevating component is rarely active, and pharyngotympanic tube ventilation usually is abnormal. Where constrictor fibers appear to be incorporated in the repaired palate, the weakened elevating action seems to get progressively weaker and is unable to cope with the increased downward pull of the palatoglossus and palatopharyngeus muscles. This deficiency occurs despite the hyperactivity of the superior constrictor fibers that make up Passavant's pad in the posterior wall of the pharynx. Velopharyngeal valving becomes increasingly difficult (Fig. 2).

CONCLUSIONS

1. Palatal and pharyngeal musculature is well developed at birth, in contrast to the facial musculature. Dissection of unoperated cleft palates showed retraction of superior constrictor fibers in the lateral pharyngeal wall, with no demonstrable insertion in the palatal tags.

2. The complete bilateral lip-jaw-palate cleft appeared with the greatest frequency. Male incidence in this category was double that of female. In clefts involving only the hard and soft palate, the incidence was twice as great for the female sample.

3. When a comparison was made of the cleft palate group as a whole with the normal groups studied by other investigators, the following was observed:

A. The cleft palate individual, as indicated by this appraisal, has a concave profile, retruded maxilla, lingually tipped incisors, retrusion of the chinpoint, a more steeply inclined lower mandibular

border and an excessive interocclusal clearance.

B. Full and relatively normal lip contour was present in less than 20 per cent of the cases where the lip was involved.

C. In younger patients, considerable epipharyngeal lymphoid proliferation was observed which possibly was compensatory.

D. Among the cases involving surgical repair of the soft palate, considerably more than a third had poor velopharyngeal action, more than half had fair and only a small proportion had sufficient for adequate normal speech.

4. The group that had been operated on showed a significant increase in deviation from the normal group in vertical and anteroposterior development of the maxilla and in local dental abnormalities. The individuals with cleft palates, whose palates had been closed before they were six months of age, showed greater deviation. The nonoperated cleft palate patients, when compared with the normal individuals, showed a vertical and anteroposterior maxillary development within normal limits. The profile appeared more convex than normal, possibly because of a slightly retruded chinpoint and possibly because of the inclusion of infants in the study. The most noticeable deviations from normal, and these were not great, were in the incisor inclinations.

5. The cleft palate patients who had been operated on before six months of age showed the greatest deviation from the normal. A number of criteria showed consistent trends toward normal in each succeeding group which had been classified according to the age at which the initial palatal surgery had been done.

6. Patients with surgically closed nonpalatal clefts had a facial pattern similar to that of the nonoperated group, with a noticeable deficiency only in the dental area.

7. More adequate velopharyngeal valving occurred in individuals whose palates had been closed after they were 2½ years old. General functional inadequacy was the rule in the majority of the surgically operated cases, however. Cleft cases that had been operated on late, even when there were no growth problems, still had varying degrees of velopharyngeal insufficiency.

The calculated means of all criteria used in the comparisons of the various groups of cleft palate and normal subjects showed a high degree of statistical significance ensuring the validity of the conclusions drawn.

The results of this study serve as an indictment of early traumatic surgery which produces considerable facial deformity and functional inadequacy. The rehabilitation of the individual with cleft palate is disappointingly unsuccessful, when judged by an appraisal of the surgical results. If the normal growth processes are not interfered with, however, and nature is given a chance, the problem will be a local one.

Men • Human beings are not all alike. From the beginning of the record and to this day there have always been big men and small men, strong men and weak men, wise men and fools. ***Dunn and Dobzhansky, "Heredity, Race and Society."***

Color and the dental profession

Howard Ketcham, A.B., New York

Nowhere is the right color more important than it is to the wearer of plastic teeth. The "user benefit" imparted to the teeth by correct color is incalculable. The better their color, the closer the match in color, the more natural the teeth look, the more they are valued in the patient's estimation.

Dentists and dental technicians have long felt the need for a reliable means of matching the color of artificial dentures and natural teeth; this problem is complicated by the fact that both incandescent and fluorescent light have peculiarities which result in color distortion. Industry today is spending enormous sums in order to insure accurate color matching of fabrics, paints, plastics and many other products; color-corrected light has been introduced in plants, laboratories, showrooms. Distances from which samples are viewed, angles at which they are held, backgrounds against which they are shown are today standardized in many firms. The dental profession may well benefit from some of this color "know-how" that is being developed by business and industry.

The terminology and the few basic facts about color are easy to learn. Color has three dimensions: hue, value and chroma. Hue is the name of the color. Value is the degree of lightness or darkness of the color. Chroma is the intensity of the color, sometimes indicated by saturation or purity. For example, an olive green is weak in chroma, an emerald green is strong in chroma.

It is of particular importance to the dentist concerned with matching teeth to know the many ways in which colors vary according to these dimensions. His ability to match colors precisely depends on the amount of color information he possesses as well as on his innate ability to discriminate between colors.

Although no one understands just how human beings perceive color, there are tools which help to measure the individual's ability to see colors. Certain tests reveal whether or not a person is color-blind. There are other tests which enable a person to determine his degree of acuity in perceiving infinitesimal differences in hue and chroma. Obviously, some simple, practical method to measure a dentist's or a dental technician's visual ability in the recognition of colors and to determine his color acuity is desirable. If such a measure were available, patients would have increased confidence in the judgment of technicians or practitioners to select the proper color for plastic teeth and gingivae. Dentists could be furnished with copies of their visual ratings—certificates of proficiency or "Eye-Q," which could be framed and hung in their offices.

About 8 per cent of all men—and thus of dentists also—are color-blind or "color-deficient." The form of extreme color deficiency is dichromatism, sometimes called two-color vision, or red-green blindness. This is the inability to dis-

Consultant to Luxene, Inc.

tinguish more than two types of hues: yellows and blues. Most dichromats confuse certain shades of reds, greens and yellows and cannot distinguish between bluish-greens, blues and violets.

Testing for color vision is not unduly complicated. Today there are excellent tests on the market suitable for use in determining degrees of color discrimination and in detecting the various types of color blindness. Colored papers, equal in value but varying in chroma, are used. These specially prepared papers are mounted in dull black plastic caps, the backs of which are numbered in consecutive order. The caps are placed in a matt black panel with the colors in the panel in haphazard order. The subject is told to arrange the colors in consecutive order between fixed terminal colors. The error score is the number of misplaced color caps.

Results of this test show that the color vision of individuals may be divided into three major categories:

1. Normal color vision. Four fifths of the subjects scored 20 or fewer errors.

2. Low discrimination with no distortion due to color blindness. One tenth of the subjects tested made more than 20 errors. Since some of the subjects with low discrimination are trained and enthusiastic color workers, it is reasonable to assume that experience cannot be depended on to overcome initial incapacity to make fine color discriminations.

3. Color blindness. The remaining tenth of the subjects tested were color-blind. According to the results of the test, there are three distinct types of color blindness: (1) green and purplish-red blindness (deuteranomaly), detected for about two thirds of the subjects in this group; (2) red and blue blindness (protanomaly), detected for about a third of the subjects; and (3) yellow and bluish-purple blindness (tritanomaly), detected for the few remaining subjects in this group.

Since standard teeth are supplied in arrays ranging from yellowish to brownish, from yellowish to greyish, and from white to pink, dental technicians and dentists must possess adequate color discrimination to cope with the problem efficiently. Because the test includes all ranges in the gamut of colors, there is a portion of the test that will correspond to the color range of any series of colored teeth. The test, therefore, can be of prime importance to the dental profession in determining visual efficiency, since it is a means of detecting low color discrimination and, more particularly, of identifying the type of color blindness.

Another simple way to test the color vision of dental workers and also the quality of the light sources they use is to employ a special slide rule containing two rows of 24 color samples. The top series of color samples is dyed with a dyestuff combination different from that of the bottom series, so that there are no true color matches. The subject attempts to find the closest possible match between top and bottom samples by sliding one row against the other under the specified type of illumination.

To test the quality and variability of light sources, the subject views the samples under various light sources, again attempting to match them. The results are an indication of the degree of similarity or dissimilarity of the light sources.

The time is not distant when all manufacturers of artificial teeth will match them to natural ones by using new scientific color-reading instruments. Without such modern scientific technics, there is no way to match artificial and natural teeth so that they will "stay matched" in daylight and in artificial light.

Other factors besides visual acuity enter into the problem of precise matching of tooth color. All external factors influencing the perception of color should be controlled as far as possible. For example, it is essential to work against a neutral background, since background

color can change the apparent hue, value and even chroma of a color.

When each tooth sample is viewed against a different background color, the visual problem is unnecessarily complicated. For maximum perceptibility of small color differences, the color of the background should be neutral so that it will not impart undesirable distortion. Extensive tests conducted to develop the best foil color for displaying teeth show the desirability of using a medium shade of gingival pink; it is psychologically valuable to have teeth displayed on a background mounting that makes them look natural.

Another factor that influences the appearance of teeth is the background color of the presentation boxes used. Some of these colors give the teeth a deceptive appearance. White backgrounds make the teeth look too chromatic. Silver backgrounds make the teeth look grey, and maroon backgrounds give the teeth an unnatural yellowish cast.

A certain pale blue is a good color to use because it brings out differences in the various shades of both tooth and gingiva colors to greatest advantage, enhances their natural look and provides a pleasant unobtrusive contrast which makes selection easy. The right shade of burgundy has a similarly flattering effect on the colors of teeth and gingivae. Since, however, it is a richer color than the blue, it calls more attention to itself and therefore makes the selection somewhat less easy.

Still another factor is the color of the clothing worn by the person who is matching colors, for clothing may impart interfering reflections to the teeth under observation. Therefore, a smock of a prescribed neutral value should be standard equipment for anyone matching colors. Furthermore, the viewing angle in any matching process has a great deal to do with the appearance of the color surface. Depending on the viewing angle, two apparently uniform tooth surfaces at times may show no color difference and at other times a decided difference. A method of accurate color designation and modern, easy-to-use color terminology are necessary to simplify the purchase of artificial teeth. The establishment of fixed color terms will make it possible for dentists and technicians to describe various requirements or color-matching difficulties over the telephone or in correspondence.

The final, but by no means least important, factor in accurate matching is lighting. Since incandescent light has no blue content, colors with blue in them are distorted under this type of light. Fluorescent light has other and different peculiarities. There is, therefore, serious need for a properly color-corrected light under which colors can be seen and matched accurately. Such a light is now available; it produces color-corrected light so that all colors can be seen with equal effectiveness. This portable light, designed for use by dentists and dental laboratory technicians, completely eliminates color distortion resulting from the unsatisfactory lighting conditions that often prevail.

The importance of this lighting innovation becomes apparent when we realize that no two people see exactly alike. In many older people, furthermore, a defect in fine color discrimination, probably due to a yellowing of the lens of the aging eye, requires compensation. This defect is a great disadvantage, particularly in the matching of objects, such as teeth, for which color is a critical factor.

101 Park Avenue

Maxillofacial prosthesis

William H. Olin, D.D.S., M.S., Iowa City

Maxillofacial prosthetics is that branch of dentistry which deals with the treatment and repair of deformities of the face and jaws, including the artificial replacement of missing parts. There are two types, namely, intraoral and extraoral. The main objective of an intraoral prosthesis is to restore function, esthetics and speech, while the main objective of the extraoral prosthesis is to restore esthetics. Some types of intraoral appliances are used as an aid to surgery or immediately after surgery to eliminate scar formation and to maintain normal contour and function of the musculature involved.

In most cases of extraoral deformity, surgical reconstruction is the method of choice. When surgery is contraindicated because of age, the condition of the patient, the extent of deformity, or the condition of the surrounding tissues, an extraoral prosthesis is indicated. A prosthesis is indicated also as a temporary measure between surgical procedures.

In the last 20 years there has been a great increase in the need for maxillofacial prosthetics, mainly because of automobile and industrial accidents, war injuries and the increased life span.

Close cooperation between the surgeon and the maxillofacial prosthetist is an essential prerequisite, especially in determining the amount of tissue to be removed, the skin grafting that may be necessary or the teeth to be extracted or retained. On this subject Appleman[1] states:

> When it is known that tissues have to be removed because of disease and must be replaced by mechanical means, the prosthodontist should be consulted before the tissues are removed.
>
> Consultation at this time, prior to operation, offers the prosthodontist an opportunity to observe the patient and formulate a treatment plan with the surgeon. The results of such consultation would enable the surgeon, if the nature and extent of the disease permitted, to retain parts of advantage and to remove those which at a later date would not only cause difficulty to the prosthodontist, but discomfort to the patient as well.

The most common causes of maxillofacial deformities that require prosthetic replacement are: (1) trauma resulting from automobile or industrial accidents and gunshot wounds, (2) surgical removal of tumors, (3) diseases such as tuberculosis and syphilis, (4) congenital deformities such as cleft palate.

One of the most difficult problems in the construction of intraoral appliances is retention. In most cases it is extremely important to retain as many teeth as possible; the retention of a single tooth will often prove to be beneficial. If teeth can be retained only for a short period of

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1. Appleman, R. M. Surgical prosthesis. J. Pros. Den. 2:401 May 1952.

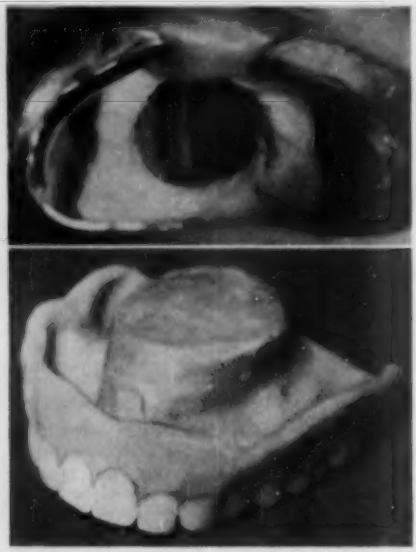


Fig. 1 • Above: Palatal perforation. Below: Maxillary prosthesis with obturator

time, it is often more satisfactory for the patient to wear a partial prosthesis until a complete denture prosthesis is required.

Retention may be obtained by various means: (1) from the teeth; (2) if the mouth is edentulous, from the remaining alveolar ridge, buccal vestibule and musculature; (3) if there is a cleft or a perforation of the hard palate, from the nasal surface; (4) if coil springs are used, from the opposing denture; (5) by implantation; (6) by the use of magnetic forces.

Another difficult problem often encountered is the making of impressions, especially if there is a perforation of the palate or difficulty in opening the mouth. The mouth opening may be exceptionally small because of loss of tissue or scarring. It is usually advisable to pack palatal perforations with cotton or petroleum jelly gauze, with care taken not to displace surrounding tissues. If the mouth opening is small, exercises are recommended to stretch the mouth. At times it may be necessary to increase the opening by surgical methods. If the patient has difficulty in opening his mouth, exercises and wedging will usually increase the opening sufficiently for impressions to be taken. In rare cases it may be necessary to perform condylectomies in order to obtain a sufficient opening.

If an individual acrylic impression tray is used, a more satisfactory impression is usually obtained. For an edentulous mandible the impression is made with modeling plastic and finished or corrected with Iowa wax. If, however, there are severe undercuts, the impression is corrected with paste rather than with wax. Likewise for an edentulous maxilla, after a tray has been constructed, an impression is made with modeling plastic. The final or corrective impression is usually made with paste.

When teeth are present in either the mandible or the maxilla, an alginate impression is made in the acrylic tray without the modeling plastic lining. If, however, there is loss of bony structure, a modeling plastic impression is made and corrected with an alginate or a paste. Teeth to be used for retention are usually crowned, not only to increase retention but for protection of the teeth as well.

The following cases illustrate some of the various types of deformities and their treatment by means of prosthetic reconstruction.

Case 1, Figure 1 • In May 1949 a 42 year old negro woman was admitted to the hospital for further treatment of a large perforation of the hard palate. On her first hospital admission several years previously the nose was absent, the nasal septum was partially destroyed and the palate was perforated. She had been treated for a luetic condition for several years. The nose had been reconstructed surgically.

The 1949 examination revealed a palatal perforation approximately ½ inch

posterior to the crest of the alveolar ridge. The remaining teeth were carious, and speech was nasal and unintelligible.

Treatment consisted of extraction of all remaining teeth and construction of complete maxillary and mandibular dentures with an obturator attached to the maxillary denture to close the palatal perforation.

Individual impression trays were constructed. The palatal perforation was packed with petroleum jelly gauze with the exception of approximately ¼ inch of the nasal surface surrounding the perforation. The maxillary impression was made with modeling plastic and a corrective impression with impression paste. The nasal surface of the hard palate was utilized for added retention.

The mandibular impression was made with modeling plastic and a corrective impression with Iowa wax. The patient had no difficulty in retention. The obturator in this case was made of soft acrylic resin; however, because of the porosity of the material, its use intraorally is contraindicated except for a temporary appliance.

On insertion of the dentures speech was normal, and function was good. Speech rehabilitation is usually not difficult for persons with acquired clefts; however, patients with congenital clefts require considerable training by a competent speech correctionist.

Case 2, Figure 2 • In April 1950, with a diagnosis of fibrosarcoma, a 41 year old white man was referred for prosthetic reconstruction after a radical resection of the left maxilla. The hard palate and the left alveolar process were missing. The alveolar process on the right side extended to the midline and was edentulous. The lesion was well healed with no evidence of recurrence.

There were 13 teeth in the mandible, all in good repair. Considerable facial depression was evident on the left side. Speech was unintelligible, and the patient experienced considerable difficulty in eating, drinking and smoking.

Treatment consisted of a complete maxillary prosthesis with restoration of a portion of the maxilla. The maxillary impression was made with an individual acrylic tray and modeling plastic, and a corrective impression with impression paste. The mandibular impression was made with alginate.

The greatest problem was that of retention. The lower second bicuspids were extracted, and a mandibular partial denture was constructed with buccal prongs in the second bicuspid region. Buccal prongs were inserted also in the maxillary denture in the region of the second bicuspids. Retention was then obtained by attaching coil springs from the mandibular partial denture to the maxillary denture.

After a few weeks of adjustment the patient was comfortable and experienced no difficulty in eating, drinking or smoking. Speech returned to normal.

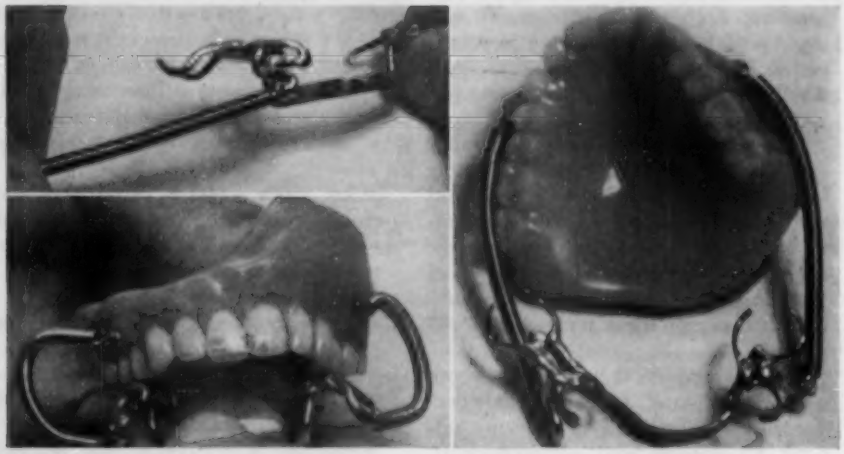
Case 3, Figure 3 • In November 1951 a 45 year old white man came to the hospital for further treatment of facial injuries received in an automobile accident five months previously.

Examination revealed a tight, scarred lower lip adherent to the crest of the alveolar ridge. Some of the tissue had been lost. There had been a fracture of the symphysis, which on roentgenographic examination proved to be well healed. The upper lip was flabby, and there was a loss of facial contour on the right side.

The maxilla had been fractured, and a portion of the alveolar ridge was missing. Three teeth remained: the first, second and third molars. They were in poor condition with severe calculus deposits, caries and bone resorption. There was a palatal perforation of about 1 cm. by 2 cm. The inferior turbinate was protruding through the perforation and was extremely painful to palpation.

Front view without prosthesis

Front intraoral view without prosthesis



Left above: Mandibular partial denture with coil springs. Left below: Maxillary and mandibular prostheses with coil springs. Right: Occlusal view of maxillary and mandibular prostheses

Prostheses with coil springs attached

Front view with prostheses

Figure 2

The mandibular alveolar ridge was slightly deformed, and there was no labial sulcus in the anterior region. Four teeth remained in the mandible: the right second molar and the left lateral incisor, cuspid and first bicuspid. These teeth also were in poor condition with heavy deposits of calculus, caries and bone resorption. Oral hygiene was poor.

Because of the condition of the teeth, gold crowns were contraindicated; however, all teeth were restored with the exception of the maxillary left first molar, which was cariously exposed and required extraction.

On consultation, the maxillofacial surgeon recommended enlargement of the mandibular labial sulcus by means of a skin graft and removal of the turbinate with closure of the palatal perforation. The skin graft was maintained in the sulcus with a modeling plastic stent sutured in position.

Two months after the last surgical procedure, individual acrylic impression trays were constructed, and impressions were made with alginate. Maxillary and mandibular partial prostheses were then constructed. Cast gold clasps were used for retention of the maxillary prosthesis. No clasps were used on the mandibular prosthesis.

After four months the patient returned for observation. Roentgenograms were taken of the teeth, and no change was noted. The patient experienced no difficulty in eating, drinking or smoking; and his speech was normal.

Case 4, Figure 4 • In September 1949 a 24 year old white woman was admitted to the hospital suffering from a gunshot wound of the face received the previous day. She had been seen by her local physician approximately one hour after the injury, at which time an emergency débridement had been performed. The oral cavity had been packed, and several external skin sutures had been placed. The patient had been given 500 cc. of plasma and 1,000 cc. of whole blood before her admission.

Examination at the time of admittance revealed a mutilated face with a wound on the left side, extending from the inner canthus of the eye through the upper lip, and several wounds on the right side of the face just anterior to the ear. The maxilla was almost totally destroyed with the exception of the posterior portion on the left side, in which three teeth remained. The right zygoma, the vomer, the nasal bones and the right condyle were destroyed. Sight in the right eye was lost. Roentgenograms revealed a fracture of the right mandible in the bicuspid region.

On September 24 with the patient under a general anesthetic, an operation consisting of further débridement, a

Fig. 3 • Left: Front intraoral view. Center: Maxillary and mandibular prostheses. Right: Front view with prostheses

tracheotomy and reduction of the mandibular fracture was performed. An impression of the intraoral defect was made with modeling plastic. From this impression a temporary acrylic prosthesis was made to prevent scarring and retraction. A Roger Anderson Universal joint connected to a plaster head cap was used to hold the prosthesis in place. Several surgical procedures followed, and after a period of approximately three months the patient was ready for further prosthetic treatment.

A small portion of the hard palate and maxilla remained on the left side. It was necessary to extract one of the remaining teeth; the other two were in good condition and free from dental caries. Because of limited mandibular movement, gold crowns could not be constructed; and it was extremely difficult to make impressions. Exercises and a wedge were used to increase the opening, and after a few days the patient could open her mouth wide enough for the necessary impressions to be taken.

An individual tray was made for the maxillary arch. An impression was made with modeling plastic and corrected with impression paste. A maxillary prosthesis was then constructed with cast gold clasps on the remaining maxillary teeth as the only form of retention.

On insertion of the prosthesis, speech was normal, and mastication was accomplished with little difficulty. Exercises were given to increase the mandibular opening, and it was planned to construct gold crowns for the remaining teeth and a new prosthesis when there was sufficient opening.

The patient returned to the hospital every four months for observation and treatment. At the present time the pa-

Fig. 4 • Left above: Patient before injury. Left below: Lateral view roentgenogram after injury. Center above: Right lateral view after emergency treatment. Center below: Left lateral view after emergency treatment. Right above: Front view with prostheses inserted. Right below: Maxillary prosthesis with cast gold clasps

Fig. 5 • Left: Palatal perforation. Gold crowns on three remaining teeth. Center: Prostheses. Right: Front intraoral view with prostheses

tient is undergoing surgical reconstruction of the nose.

Case 5, Figure 5 • In March 1950 a 43 year old white woman was referred to the hospital with a perforation of the hard palate which had been present for 30 years. She complained of difficulty in eating, drinking and talking.

The etiology was unknown; however, the patient stated that when she was approximately 13 years of age, while recovering from diphtheria she had noticed a hole in the roof of the mouth. She had gone to her local physician, and he had "scraped the bone." The perforation had not increased in size. Examination revealed a perforation of the hard palate and alveolar ridge on the left side, extending from the cuspid to the region of the tuberosity half way to the midline.

The mandibular teeth were extracted. Three maxillary teeth were retained: the right cuspid, the first bicuspid and the second molar. These teeth were restored with cast gold crowns. Root canal therapy was necessary for the cuspid.

Individual impression trays were then constructed for both arches. Modeling plastic and Iowa wax were used for making the lower impression. The palatal perforation was packed with petroleum jelly gauze, and the maxillary impression was made with alginate. A partial upper denture with an obturator and a complete lower denture were then constructed. Immediate improvement in speech was noted, and the patient had no difficulty with mastication.

Case 6, Figure 6 • In May 1950 a 58 year old man entered the hospital for prosthetic reconstruction after radical surgery of the right eye and zygomatic area, necessitated by carcinoma. The surrounding tissues were well healed with no evidence of recurrence of the carcinoma.

The perforation was packed with cotton, and a facial impression was made with alginate. Stone plaster was used to make a working model. The prosthesis was sculptured in dental baseplate wax. A plastic eye was selected and inserted in the wax model. The prosthesis was finished with soft acrylic resin. Eyelashes and coloring were then added. Retention was obtained from the nasal surface of the deformity and from the bridge of the glasses.

Case 7, Figure 7 • In May 1949 a 32 year old white man came to the hospital for prosthetic reconstruction of a portion of the left auricle, which had been lost as a result of an automobile accident.

An impression of the remaining portion of the ear and surrounding area was made with alginate. A stone plaster model was made and the ear sculptured in dental baseplate wax. The finished ear was made with soft acrylic resin.

Fig. 6 • Left: Without facial prosthesis. Right: With facial prosthesis

Retention in this case was obtained from the remaining portion of the ear and from the bow of the glasses, although in many cases an adhesive is necessary for retention. Inasmuch as the patient was a farmer and spent a great portion of his day in the sunlight, it was necessary to make several ears of various shades.

Case 8, Figure 8 • In January 1949 a 23 year old white man was referred to the hospital for further treatment of a repaired bilateral cleft lip and cleft palate. Because of a previous postoperative infection, surgery of the palate had been unsuccessful.

Examination revealed a maxilla resembling an infant's. There were three teeth present: a central incisor, a lateral incisor and a bicuspid. A cleft of approximately one inch in width extended through the soft and hard palates to approximately one cm. lingual to the remaining teeth. The mandible was somewhat deformed, severe caries was present, and the teeth were malaligned. Speech was acceptable; the patient had little difficulty in eating or drinking.

Treatment consisted of extraction of all remaining mandibular teeth and construction of gold crowns for the remaining maxillary teeth. Individual acrylic impression trays were constructed. The mandibular impression was made by using modeling plastic and correcting it with Iowa wax. The maxillary impression was made with alginate.

A complete maxillary overlay type denture and a complete mandibular denture

Fig. 7 • Left: Without prosthesis. Right: With prosthesis

were made. Retention for the maxillary denture was obtained by means of cast gold clasps.

Case 9, Figure 9 • In March 1951 a 27 year old white woman was referred for treatment of cleft palate. Examination revealed an unoperated cleft of the palate extending to the junction of the maxilla and the premaxilla. The patient had been wearing an obturator made several years before. There were several teeth remaining, but they were in poor condition.

Treatment consisted of extraction of the remaining teeth and insertion of complete maxillary and mandibular dentures with an obturator attached to the maxillary denture. Individual impression trays were constructed for both arches. Impressions were then made with modeling plastic. A mandibular corrective impression was made with Iowa wax and the maxillary corrective impression with impression paste. Retention for the maxillary denture was obtained from the alveolar ridge and the nasal surface of the cleft.

In the construction of the obturator

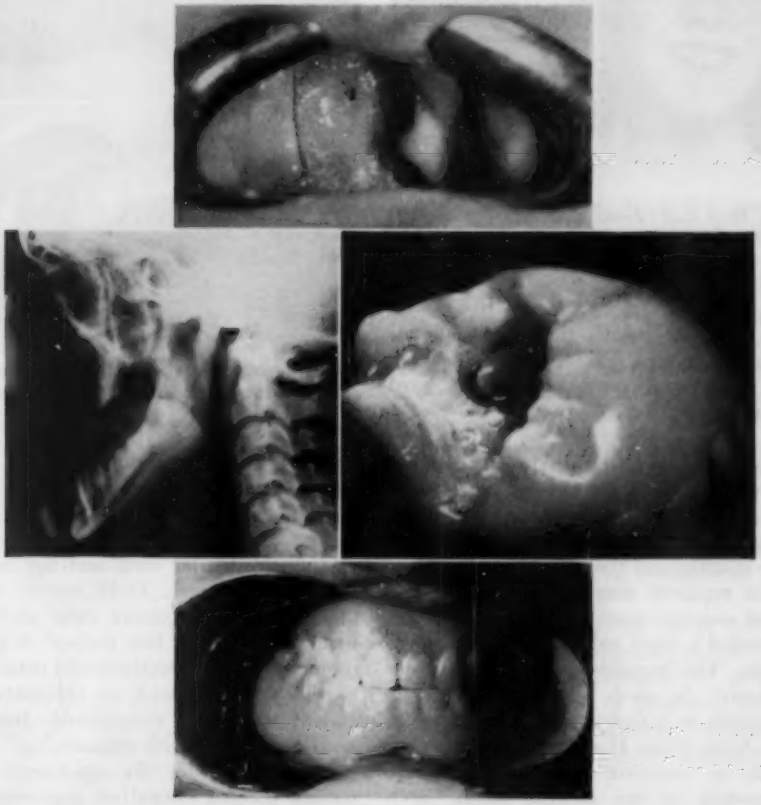


Fig. 8 • Above: Intraoral view of cleft. Center left: Lateral roentgenogram. Center right: Maxillary prosthesis. Below: Front view with prostheses inserted

Fig. 9 • Left: Intraoral view of congenital cleft palate. Center: Intraoral view of maxillary prosthesis and obturator. Right: Maxillary and mandibular prostheses

Fig. 10 • Left: Front view before treatment. Right: Front view with prostheses inserted

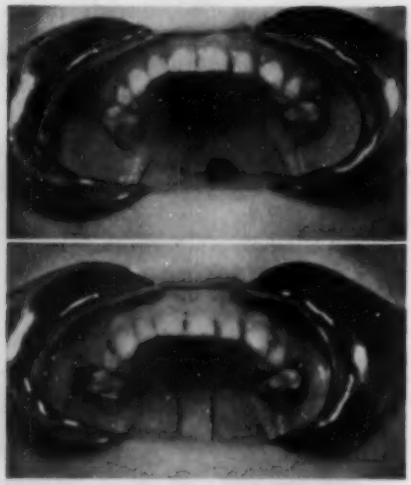


Fig. 11 • Above: Intraoral view without obturator. Below: Intraoral view with obturator

for the cleft palate, the fixed bulb, or Fitzgibbon, type was used, with the bulb or pharyngeal portion made of hard acrylic resin.

Case 10, Figure 10 • In January 1952 a 17 year old white girl entered the hospital for further treatment of cleft palate. The original cleft extended to the junction of the maxilla and the premaxilla, and had been repaired surgically when the patient was two years of age. Examination revealed a short palate with little movement. The mandible was normally developed; the teeth were carious and the majority in a faulty position. There was an Angle Class II dentofacial deformity with an excessive overbite and severe crowding of the anterior teeth. Both arches were somewhat collapsed on the right side, and the left cuspid was high on the labial aspect. Oral hygiene was poor. Speech was nasal and almost unintelligible.

Treatment consisted of extraction of all the mandibular teeth and the maxillary anterior teeth. Gold crowns were placed on the maxillary right and left first bicuspids and first molars. A mandibular complete prosthesis and maxillary partial prosthesis with an obturator attached were then constructed. Impressions were made with alginate.

On insertion of the appliances the patient showed immediate improvement in her personality. She was referred to a speech correctionist, who is spending

considerable time helping to improve her speech.

Case 11, Figure 11 • In September 1951 a five year old white boy came to the hospital for treatment of a cleft of the soft palate. Examination revealed well-developed dental arches free from dental caries and with normal occlusion. Surgery performed on the cleft when the boy was two years old had been unsuccessful, and the mother did not desire further surgery.

Treatment consisted of placing orthodontic bands on the second deciduous molars. A .025 steel wire was spot-welded to the buccal surface of the bands, although at the present time ready-made stainless steel crowns are used on deciduous teeth in place of bands. An acrylic palate with bent wire clasps was then constructed, and an obturator was attached. This temporary obturator is to be changed as the dental arches develop.

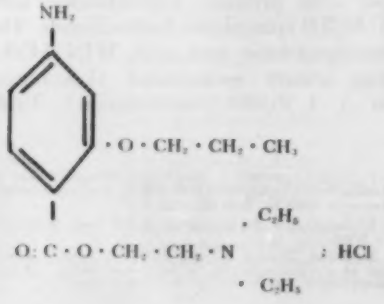
The patient was referred to a speech correctionist and has shown considerable improvement in speech in a year's time.

•

A new local anesthetic agent

Edward C. Dobbs, D.D.S.; Charles W. DeVier, Jr., D.D.S., and Leonard Rapoport, D.D.S., Baltimore

Within the last few years several new drugs have been introduced as anesthetic agents. WIN 3459-2 (Ravocaine) is a substitute ester of para-aminobenzoic acid and therefore differs from procaine. Chemically, it is the monohydrochloride of 2-diethylaminoethyl 4-amino 2-propoxybenzoate, with the following structure:

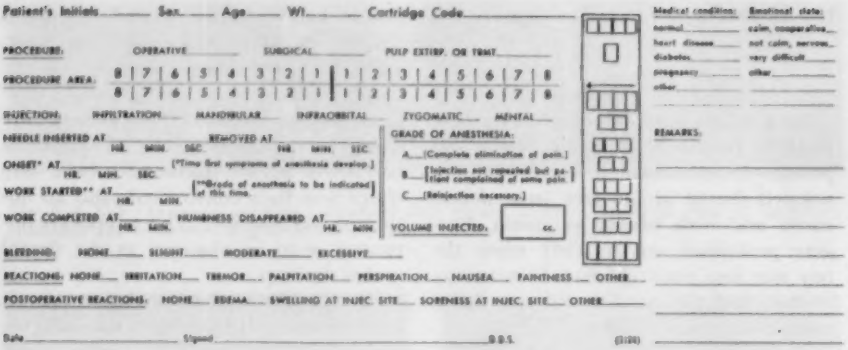


The alkaloid base of this drug as of other local anesthetic drugs is not readily soluble in water, and, therefore, this drug is prepared in the hydrochloride form.

WIN 3459-2 occurs as a white crystalline solid which melts at 148°-150°C. The salt is soluble in water up to 20 per cent. In tests run on the drug, the pH of a 0.1 per cent solution was 5.5. At a pH of 7.0 there was no evidence of precipitation.

The acute toxicity of WIN 3459-2, based on LD_{50} determinations in mice, was as follows: administered intravenously, 8 times that of procaine; subcutaneously, 9.5 times; and intraperitoneally, 2.5 times. Results obtained by

Department of pharmacology and therapeutics, Dental School, Baltimore College of Dental Surgery, University of Maryland.


Patient's Initials_____ Sex_____ Age_____ Wt._____ Cartridge Code_____

PROCEDURE: OPERATIVE_____ SURGICAL_____ PULP EXTIRP. OR TRMT._____

PROCEDURE AREA: 8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

INJECTION: INFILTRATION_____ MANDIBULAR_____ INFRAORBITAL_____ ZYGOMATIC_____ MENTAL_____

NEEDLE INSERTED AT_____ HR. MIN. SEC. REMOVED AT_____ HR. MIN. SEC.

ONSET* AT_____ HR. MIN. SEC. (*Time first symptoms of anesthesia develop.)

WORK STARTED** AT_____ HR. MIN. (**Grade of anesthesia to be indicated at this time.)

WORK COMPLETED AT_____ HR. MIN. NUMBNESS DISAPPEARED AT_____ HR. MIN.

GRADE OF ANESTHESIA:
A_____(Complete elimination of pain.)
B_____(Injection not repeated but patient complained of some pain.)
C_____(Reinjection necessary.)

VOLUME INJECTED:_____ cc.

BLEEDING: NONE_____ SLIGHT_____ MODERATE_____ EXCESSIVE_____

REACTIONS: NONE_____ IRRITATION_____ TREMOR_____ PALPITATION_____ PERSPIRATION_____ NAUSEA_____ FAINTNESS_____ OTHER_____

POSTOPERATIVE REACTIONS: NONE_____ EDEMA_____ SWELLING AT INJEC. SITE_____ SORENESS AT INJEC. SITE_____ OTHER_____

Date_____ Signed_____ D.D.S.

Medical condition: Emotional state:
normal_____ calm, cooperative_____
heart disease_____ not calm, nervous_____
diabetes_____ very difficult_____
pregnancy_____ other_____
other_____

REMARKS:

using trypan blue intradermal irritation tests in rabbits showed its toxicity to be about eight times as irritating as tetracaine. The anesthetic potency of WIN 3459-2 was about seven times that of procaine.[1,2]

A clinical evaluation was made to determine the potentialities of WIN 3459-2 as a local anesthetic agent for dental use. Patients were obtained from the dental school clinics. All injections were made by senior dental students. The data were collected on a printed card, shown in the illustration, which served also as a permanent record. The "induction time" was measured in seconds from the time the needle was withdrawn from the tissues until the patient first perceived numbness in the injected region or, in case of a nerve block injection, in a remote region. A stop watch was used. The "duration of anesthesia" was the time elapsing after the needle was withdrawn until the pain caused by instrumentation returned. This time factor, expressed in minutes, was not determined for all patients, since the instrumentation was often completed before the period of anesthesia ended. In such cases the "working time" was recorded, which is always shorter than the true "duration of anesthesia." The "duration of numbness" was measured in hours and minutes from the withdrawal of the needle until the last symptom of numbness disappeared from the injected region. A postal card was given to each patient for recording this time in hours and minutes.

The degree of anesthesia was recorded (Table 1) as "A," absolute freedom from pain during the operation; "B," some pain experienced during the operation but no need for reinjection; "C," pain experienced and reinjection given. Values for reinjected patients, that is, patients who received an additional injection ("C"), were not included in the averages listed in Table 2.

The anesthetic solutions were dispensed in 2.2 cc. cartridges. The students using the solutions were not aware of their contents, as all carton and cartridge markings were in code.

To have the data comparable, the results for various concentrations of WIN 3459-2 were compared with those for 2 per cent procaine hydrochloride with 1:50,000 epinephrine hydrochloride. The vasoconstrictor used with WIN 3459-2 was always levarterenol (Levophed) in a 1:30,000 concentration.[3] Table

1. Supplement No. 2, Additional laboratory data on Ravocaine hydrochloride (Win 3459-2). Sterling-Winthrop Research Institute, July 25, 1953.

2. Luduena, F. P. Ravocaine: a new local anesthetic. In press.

3. Dobbs, Edward C., and DeVier, Charles. L-arterenol as a vasoconstrictor in local anesthesia. J.A.D.A. 40:433 April 1950.

Table 1 • Grades of anesthesia attained with various combinations of WIN 3459-2 and with procaine hydrochloride

Solution no.	Anesthetic	No. of cases	Percentage of subjects with grade of anesthesia		
			A. No pain	B. Pain, no reinjection	C. Pain and reinjection
			%	%	%
1	Procaine HCl, 2.0% with epinephrine 1:50,000	97	72±4.5	23±4.2	5±2.2
2	WIN 3459-2, 0.5% with levarterenol 1:30,000	86	81±3.3	11±3.1	8±2.9
3	WIN 3459-2, 0.75% with levarterenol 1:30,000	89	85±3.8	9±3.0	6±2.5
4	WIN 3459-2, 0.4%, procaine HCl 2% with levarterenol 1:30,000	100	91±2.8	7±2.6	2±1.4
5	WIN 3459-2, 0.4%, procaine HCl 2% with levarterenol 1:30,000*	4,142	92±0.7	6±0.3	2±0.07

*Values submitted by Cook-Waite Laboratories, Inc.

2 gives a summary of the "induction time," the "working time" and the "duration of anesthesia" for the five solutions which were evaluated.

A critical method for evaluating the clinical toxicity of local anesthetic preparations has not been developed. Laboratory experiments on animals, which measure the lethal dosages of local anesthetic drugs, do not provide practical measurements for dental office use, since for dental purposes only small amounts of a drug are injected. The untoward reactions observed in dental anesthesia are probably the results of idiosyncrasies and hypersensitivity of individual patients rather than of a gram-per-kilogram toxicity.[4] As untoward reactions of this type are subjective, it is extremely difficult to eliminate them or to make corrections for them. Objective changes, such as respiratory rate and amplitude, pulse rate and volume, rise or fall in blood pressure and fainting,

4. Dobbs, E. C., and Kader, M. I. Local anesthetic solutions: their toxicity and treatment. Oral Surg., Oral Med. & Oral Path. 3:52 Jan. 1950.

Table 2 • Record of induction time, working time and duration of anesthesia for various combinations of WIN 3459-2 compared with procaine hydrochloride

Solution no.	Anesthetic	Induction time	Working time	Duration of anesthesia
		sec.	min.	hours
1	Procaine HCl, 2% with epinephrine 1:50,000	108	64	3.0
2	WIN 3459-2, 0.5% with levarterenol 1:30,000	132	45	1.7
3	WIN 3459-2, 0.75% with levarterenol 1:30,000	54	90	1.8
4	WIN 3459-2, 0.4%, procaine HCl 2% with levarterenol 1:30,000	41	51	3.0
5	WIN 3459-2, 0.4%, procaine HCl 2% with levarterenol 1:30,000*	86	—	2.6

*Values submitted by Cook-Waite Laboratories, Inc.

can be measured; but corrections cannot be made for the emotional patterns of patients. Therefore, no toxicity values are presented in this report.

It is possible to state, however, that no untoward reactions occurred after the injection of any of these preparations. There were no complaints from patients of stinging when the solutions were being injected nor later of swelling, redness, pain or trismus at the site of the injection. There were no reports of ulcers occurring at the point of insertion of the needle.

When 0.1 cc. of an anesthetic solution was injected intradermally, no pain was experienced with Solution no. 1, the conventional procaine-epinephrine solution (Table 1); but with Solution no. 4 (WIN 3459-2, 0.4 per cent, procaine hydrochloride 2 per cent, with levarterenol 1:30,000), 50 per cent of the injections caused a stinging sensation. This sensation is common with products of higher potency. There were no systemic reactions reported with any of the solutions.

Blood pressure studies in which Solutions no. 1 and no. 4 were compared were not significant. The pressure changes were more characteristic of the vasoconstrictor than of the anesthetic drug. Blood pressure determinations were taken at minute intervals for ten minutes after the injection. The increase in number of millimeters of mercury from the preinjection level was recorded as a plus numeral and the decrease as a negative numeral. When these numerals were added algebraically, the results for the epinephrine solution (no. 1) were negative for systolic pressures and positive for diastolic pressures. For levarterenol (Levophed) in Solution no. 4, both the systolic and diastolic blood pressures were positive. These data were interpreted to mean clinically that Solution no. 1 has a tendency to lower the systolic blood pressure slightly and to elevate the diastolic pressure slightly. For Solution no. 4, both the systolic and diastolic blood pressures were elevated. Numerical extremes for results with levarterenol in Solution no. 4 were greater and more sustained than for results with the epinephrine solution (no. 1). The blood pressure readings were made with a Tycos aneroid with a hook-type cuff and a Bowles' model stethoscope.

The changes in pulse rate were determined by digital examination of the radial artery. Solution no. 1 produced cardiac acceleration of both rate and amplitude in most instances, while Solution no. 4 generally produced cardiac retardation. The changes were greater with the epinephrine solution (no. 1) than with the levarterenol solution (no. 4).[3]

Clinical evidence shows that patients are less aware of changes in blood pressure than of changes in cardiac excitation. Cardiac acceleration with epinephrine is fortunately of short duration, that is, from two to five minutes. The blood pressure changes usually were of longer duration, more than ten minutes, with both Solutions no. 1 and no. 4. The extremes in rise in blood pressure were greater for the hypertensive patients when levarterenol was used.

DISCUSSION

The data in Tables 1 and 2 for Solution no. 5 were compiled from the results of over 4,000 clinical trials by over 150 dentists. This solution was similar in content to no. 4. The authors are of the opinion that the data for Solution no. 5 were not collected under as critical conditions as the other data. These data, however, do have the advantage of having been collected under practical conditions; the solution was administered in each case by a dentist in a dental office to a private patient, and a much larger sampling was obtained from various sections of the country. The grades of anesthesia obtained with Solution no. 5 ap-

proximated closely those obtained with Solution no. 4 (Table 2). The induction time for no. 5 was twice as long as that for no. 4. This difference was probably due to different interpretations of "induction time" and to the fact that stop watches were not always used.

Furthermore, for Solution no. 5, the rate of occurrence of clinical reactions was 3.1 per cent. The reactions usually observed were irritation, tremor, palpitation, headache, perspiration, nausea, faintness, respiratory difficulty and weakness. Many of these reactions were probably psychogenic in origin, but it was impossible to distinguish with certainty between these reactions and reactions caused directly by the anesthetic solution.

Headache was probably caused by the vasoconstrictor. In any event, the rate for all headaches was only 1 in 2,300 cases, or approximately 0.04 per cent. Very rarely, in about 1 out of 200,000 cases, the headache was reported to be severe, at times lasting overnight. Usually, however, it was mild and disappeared spontaneously without special medication. This symptom was not observed when the other solutions were used.

CONCLUSIONS

A comparison of the effects on patients of an anesthetic solution containing procaine, 2 per cent; WIN 3459-2, 0.4 per cent; and levarterenol, 1:30,000, with the effects of the conventional procaine-epinephrine solution led to the following conclusions:

1. The WIN 3459-2 solution is an anesthetic mixture of high potency, producing satisfactory anesthesia for operative dentistry in 91 per cent of cases.

2. There is less need for reinjection with this solution; reinjection is necessary for only 2 out of 100 patients.

3. The onset of anesthesia symptoms is rapid, occurring in about 40 seconds.

4. The working time, about 50 minutes, is adequate.

5. The period of numbness is relatively short, lasting about three hours.

6. There is no apparent clinical irritation from the use of the drug.

7. The clinical toxicity is no greater than that of other drugs used for the same purpose.

The Influence of History on Future Developments • Medical history teaches us where we came from, where we stand in medicine at the present time, and in what direction we are marching. It is the compass that guides us into the future. If our work is not to be haphazard but to follow a well-laid plan, we need the guidance of history, and it is not by accident that all great medical leaders were fully aware of the value of historical studies.

It is a sheer waste of effort to oppose powerful social trends. Historical analysis reveals that these trends are not accidental but the result of the whole economic and social structure of a given society. We can influence developments and can take an active part in shaping the future—there is no reason for fatalism—but we can do so only in certain directions. And history tells us what these directions are. *Henry E. Sigerist, "A History of Medicine," 1951, Vol. I, p. 32.*

Dental anomaly: early exfoliation of deciduous and permanent teeth

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An unusual abnormality of the dentition, observed in a child, consisted of early maturation, eruption and shedding of teeth in both the deciduous and permanent dentitions. Other factors which represented a curious deviation from the normal state were microdontia, observed chiefly in the permanent teeth, and the presence of a supernumerary tooth in the permanent dentition. The anomaly did not seem to be associated with systemic abnormality or disease, such as endocrine dysfunction, disturbance in calcium metabolism, febrile disease, developmental and acquired skeletal or extraskeletal deformities and abnormalities, or reticuloendotheliosis, nor did it seem to have a hereditary basis. The author has been unable to find a reference to such an anomaly in the literature.

REPORT OF CASE

Clinical and Roentgenographic Aspects. A white boy was first seen in dental consultation on December 14, 1948, at the age of 8½ months, because of the early eruption and loss of deciduous incisor teeth. The lower deciduous central incisor teeth began to erupt at 2½ months of age, and all 8 deciduous incisors had erupted and been shed at the age of 8½ months. The patient's mother stated that the deciduous incisors were shed as soon as they erupted. The maxillary first deciduous molars had erupted, and the mandibular first deciduous molars were in the process of erupting when the patient was examined.

The patient was seen next on October 19, 1949, at the age of approximately 18 months, when roentgenograms were made (Fig. 1, *a*). Clinical examination revealed that all deciduous molars and all but the lower left deciduous cuspid were erupted and present. The mother volunteered the information that the lower left deciduous cuspid had been shed spontaneously. The mandibular right deciduous cuspid was loose and about to be shed. At this time the development of the permanent teeth as shown by the roentgenogram seemed to be somewhat accelerated.

On February 2, 1952, at the age of 3 years 10½ months, the patient was examined again (Fig. 1, *b*). Two permanent mandibular central incisor teeth, which were quite mobile, had erupted. The 4 first permanent molars also had erupted at this time, but these were not mobile. The crowns of these 4 molar teeth were small. In the roentgenogram the permanent mandibular central incisor teeth appeared to be perched on the crest of the alveolus. The apexes of these teeth were flat rather than tapered. The patient's mother related that the permanent mandibular central incisor teeth started to erupt at 3½ years of age. The

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early eruption of the mandibular central incisor teeth was attributed in part to the early loss of the deciduous teeth in this region; but all 4 first permanent molar teeth erupted in a zone which could not be affected by the early loss of deciduous teeth.

The color of the mandibular central incisor teeth was a light dusky gray. It was observed in the roentgenogram that the pulp chambers of practically all the permanent incisors had almost no crowns and that the pulp was limited to the root portion of these teeth. The crowns of the

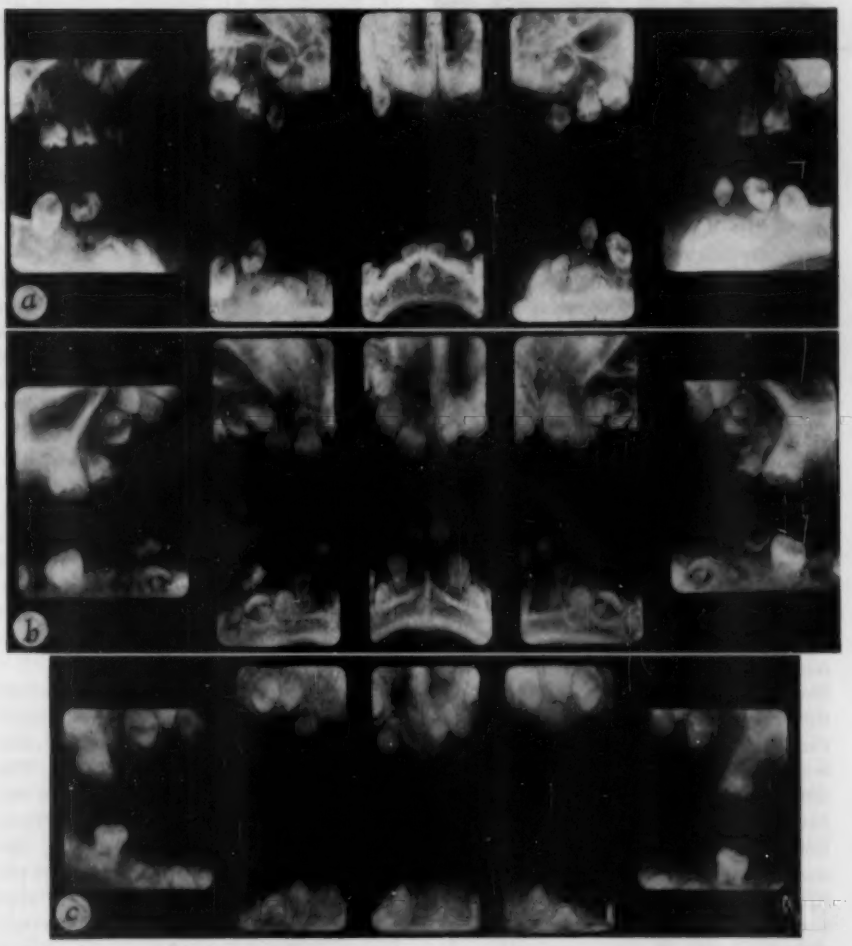


Fig. 1 • Roentgenograms made at various ages. a: At 18 months. Deciduous incisor teeth and mandibular left deciduous cuspid tooth are absent. Remaining deciduous cuspid teeth and mandibular deciduous first molar teeth have poorly developed roots. Development of permanent dentition appears somewhat accelerated. b: At 3 years 10½ months. c: At approximately 4 years 9 months

Fig. 2 • Patient at approximately 4 years 2 months; a, without, and b, with dentures in place

permanent teeth, as seen in the roentgenogram, all appeared to be exceptionally small with the developing cuspids especially microdontic. The root development of the permanent incisor teeth was believed to be somewhat advanced for 3 years 10½ months of age. Likewise, the root development of all 4 first permanent molar teeth was considerably advanced. A supernumerary tooth was present in the maxilla in the right central incisor region. There was no evidence of the development of the permanent maxillary second bicuspid teeth in the roentgenogram taken at that time. Four deciduous molars remained, and these were involved with caries to various degrees.

The patient returned two months later at the age of 4 years 1 month. The permanent mandibular central incisor teeth had sloughed spontaneously. At this time the 4 deciduous molars were extremely carious and loose, and they were extracted. It was then obvious that the patient was in need of supplemental masticating surface, for only the 4 microdontic first permanent molar teeth remained. These teeth incidentally were not mobile and occluded fairly well. The decision was made to construct artificial dentures, with the full realization that new dentures would have to be constructed at repeated intervals to compensate for growth of the jaw (Fig. 2). The dentures were designed to retain the 4 first permanent molar teeth; clasps were not employed on these teeth.

The patient became oriented readily to the artificial dentures, and they proved to be a valuable assistance in mastication. When the patient was examined on July 14, 1952, at the approximate age of 4 years 3½ months, it was noted that the permanent left maxillary central incisor and both mandibular lateral incisor teeth had started to erupt. Pressure from the denture over the site of these erupting teeth was relieved with the hope that these teeth could be retained as useful members of the dentition. It became obvious, in spite of this effort, that they also would slough; hence, all 3 teeth were removed and submitted to the laboratory for histopathologic study.

On January 7, 1953, at the age of 4 years 9 months, the child was seen again in dental consultation. The permanent left maxillary lateral incisor was observed to have erupted partially. The child said that the alveolus adjacent to this tooth was painful. Pressure from the maxillary denture covering the area of the maxillary alveolus where the left lateral incisor tooth was erupting was generously relieved. In spite of this measure, it was doubted seriously that this tooth would ever become a useful member of the dentition because of its extreme mobility and the seeming absence of supporting alveolar bone (Fig. 1, *c*).

From the roentgenogram it was obvious that all 4 permanent mandibular incisors and the maxillary left permanent central incisor had been lost. The tooth which had just erupted under the maxillary denture, namely, the permanent maxillary left lateral incisor, appeared to be situated in a precarious position in the maxilla. The adjacent supporting alveolus appeared to be opening up a space around the cervical portion of the root of this tooth to facilitate its exfoliation. The root appeared unusually blunt, and the pulp seemed to be confined to the root. The pulp in most

of the permanent teeth observed in the roentgenogram was unusually receded for a patient aged 4 years 9 months. It was apparent that the maxillary left second bicuspid was beginning to calcify. The maxillary right second bicuspid gave no definite evidence of calcification, but there was a slight circumscribed radiolucency in the area where this tooth normally would form, which might indicate that this tooth also would undergo development.

There was roentgenographic evidence that both permanent mandibular second molars would develop, since an edge of the crowns of these teeth could be observed. A sufficient region of the maxilla was not included in the roentgenogram to permit a statement as to the presence or absence of the permanent maxillary second molars. The roots of the mandibular first permanent molars were particularly bulbous in shape. Most of the teeth appeared microdontic except the maxillary first bicuspids, but it is possible that these teeth appeared larger than their actual size because of distortion resulting from the angulation employed in the exposure of the films.

The supernumerary tooth still remained in the right incisor region of the maxilla and may have been supplying retention for the right maxillary central incisor.

Advanced dental development was most evident in the incisor, cuspid and first molar teeth. The maxillary left second bicuspid, on the contrary, did not show similar early development. Its status could be observed in the roentgenogram as one in which calcification was just being initiated at the age of 4 years 9 months. This tooth normally undergoes initial calcification at approximately 3 years of age.

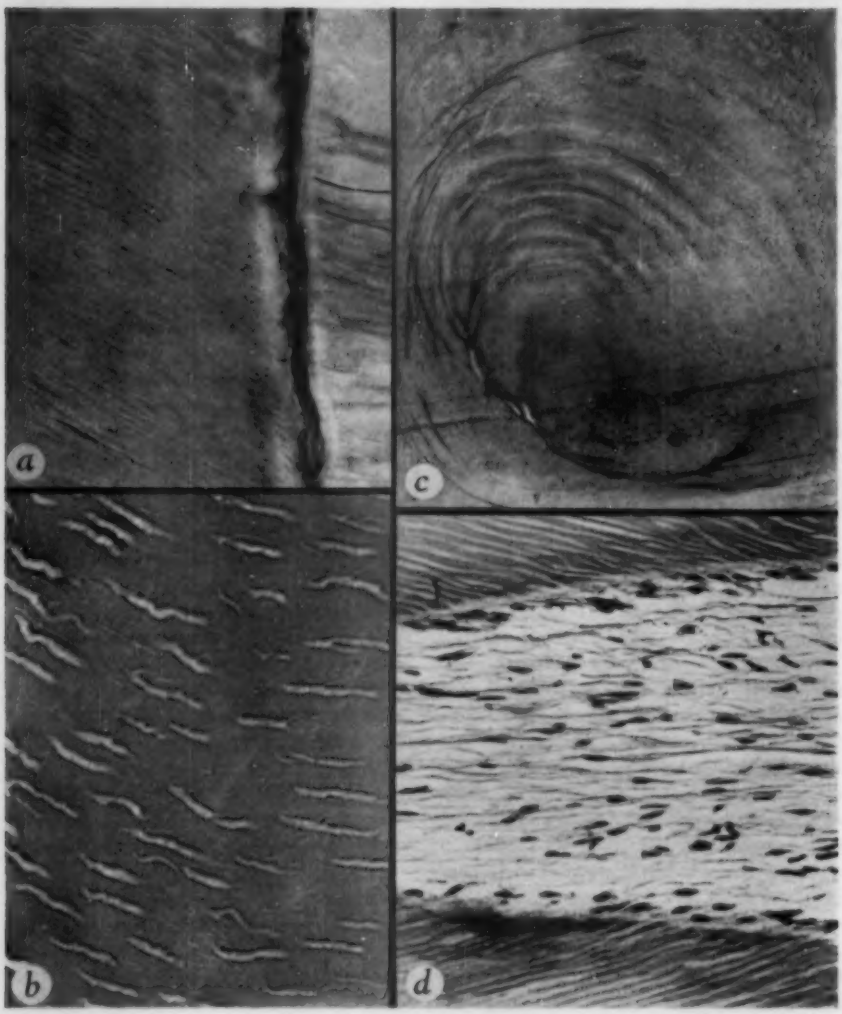
With regard to the early eruption of teeth in this patient, the roentgenogram showed that the maxillary left lateral incisor was erupted at 4 years 9 months of age. The roentgenogram showed also that the right maxillary lateral incisor was about to erupt. It was obvious also that the 4 first permanent molar teeth were fully erupted. Actually these had erupted approximately one year prior to the making of this roentgenogram.

Microscopic Findings • When ground sections of the teeth were studied, the enamel was observed to be essentially normal (Fig. 3, *a*). The dentin was abnormal in that the tubules were sparse and widely spaced (Fig. 3, *b*). Interglobular spaces, however, were not prominent. In some zones the dentin had a bizarre, whorled arrangement (Fig. 3, *c*). In some instances it was noted that the dentinal tubules had an incisal direction as they emerged from the pulp in the cervical and root portions of the tooth rather than the usual horizontal course from the pulp to the external surface of the root and cervical portion of the crown. This situation may have resulted from rapid pulpal recession combined with rapid eruption of these teeth so that there was a tendency for the dentinal tubules to be stretched out in a vertical direction. Few odontoblasts were present in the pulp tissue (Fig. 3, *d*). This tissue otherwise appeared to be virtually normal except that the pulp chamber was exceptionally small for a young permanent tooth. The patient was 4 years 3½ months old when this tooth was lost.

An examination of the root surfaces of these permanent teeth revealed that there was little, if any, primary cementum lining the root surfaces (Fig. 4). In only a few instances was dysplastic secondary cementum or osteocementum involved in a process to repair portions of the root surface which had been resorbed.

The apexes of the root canals in the permanent teeth examined microscopically were not closed at this early age, 4 years 3½ months. Neither was a root sheath of Hertwig observed in this part of the teeth. The significance of this finding is difficult to assess because so

Fig. 3 • a: Ground section of tooth showing, on the left, essentially normal histologic features of enamel. To the right, thin zone of dentin is evident. × 350. b: Decalcified tooth showing dentin. Dentinal tubules are few and widely spaced. Lateral branches of main tubules can be seen. × 400. c: Decalcified tooth showing dentin with whorled arrangement of tubules. × 225. d: Tooth pulp displaying unusually few odontoblasts lining dentinal walls of pulp chamber. × 350



delicate a structure could have been separated from the tooth when it was curetted from its position in the jaw.

Past Medical History • The patient was examined at repeated intervals from a pediatric standpoint in an attempt to correlate the dental findings with a systemic abnormality or disease. The only associated medical abnormality was mild bronchial asthma, which appeared and was diagnosed at 4 years of age. It was felt that the asthma had no etiologic association with the dental anomaly. The patient had no convulsions, rickets, scurvy or history of fractures before the age of 2½ years. Roentgenograms of the wrist and hand made at 2½ and again at 4½ years of age did not disclose any abnormality, and it was observed that the bone age was consistent with the chronologic age.

The patient weighed 6 pounds and 9 ounces at birth; he walked at the age of 11 months. He weighed 23½ pounds and was 34 inches tall at 2½ years of age. At 4 years of age he weighed 29 pounds and measured 37 inches.

The hematologic findings were normal. Biochemical studies of the blood made at 2½ years of age disclosed essentially normal values: serum calcium, 10.4 mg. per 100 cc. (normal 9 to 11 mg. per 100 cc.); serum phosphorus, 4.6 mg. per 100 cc. (normal for children 4.5 to 5.5 mg. per 100 cc.); and serum alkaline phosphatase, 5.4 Bodansky units (normal 5 units for adults but higher for children).

Fig. 4 • Root of permanent tooth showing little, if any, cementum. Fibers of periodontal membrane must be incorporated in extremely minute layer of primary cementum in left portion of photomicrograph. Presence of cementum lining root surface on right side is doubtful. × 400

COMMENT

This case appears to represent a strictly dental anomaly involving both deciduous and permanent teeth in which early maturation, early eruption, early exfoliation, microdontia and the formation of a supernumerary tooth are noted. The anomaly appears to be unrelated to systemic disease or abnormality. It seems to be primarily a matter of mesenchymal dysplasia. The microscopic appearance of the enamel seems normal, but the dentin, cementum and pulp appear to deviate from what is usually observed.

There are, however, some inconsistencies in this case. One inconsistency is the possible congenital absence of the right maxillary second bicuspid tooth, whereas in the region of the right maxillary central incisor there is a supernumerary tooth, which is developing along with the permanent dentition. Another inconsistency is seen in the maxillary left second bicuspid. This tooth is almost two years behind schedule in undergoing initial calcification. This event seems contrary to the general schematic pattern of advanced dental development observed in this patient. It is odd also that the first permanent molar teeth do not shift position in the jaws whereas the other teeth which have erupted anterior to them give evidence of being shed quickly. The roots of the first permanent molar teeth seem

to be better developed and further advanced in their development than are the roots of those teeth of the permanent dentition which normally undergo development at the same time. The roots of the permanent mandibular first molar teeth are actually bulbous. It is possible that these teeth are partially ankylosed.

Some consideration has been given to the possibility that the feature early exfoliation is associated only with that part of the jaw which has supported deciduous teeth, for this is the zone to which the early shedding is limited at this time. Only time and further observations of the dental development will disclose whether a pattern of this type will or will not be followed.

It should be noted that initial calcification took place approximately on schedule. The exception was in the maxillary second bicuspid region where the initial evidence of calcification was retarded. After calcification had once been initiated, however, the tempo of dental development was accelerated, evidence that the crowns of the teeth were formed only slightly early, whereas root formation was considerably hastened. The probable reason is that the mesodermal dental papilla was expediting its function of laying down mesodermal dental structures.

The interval by which the time of eruption of the deciduous teeth antedated the usual time ranged from 3½ months for the central incisor region to one year for the second molar and cuspid regions. So far, eruption of the permanent teeth has occurred at least three years earlier than it usually occurs. The various deciduous teeth were lost five to seven years earlier than usual.

Exfoliation of permanent teeth was observed at 3¾ years of age for the mandibular central incisors, at 4 1/6 years for the mandibular lateral incisors, and at 4 1/6 years for the maxillary left central incisors. The maxillary left lateral incisor was about to be shed at approximately 5 years of age.

Histologically, the dentin was somewhat suggestive of hereditary dentinogenesis imperfecta but differed in the fact that numerous interglobular spaces were absent. From a clinical point of view it would seem that the rapid recession of the pulp chamber with little, if any, coronal pulp and the relatively small size of the roots as compared to the crowns would also be suggestive of hereditary opalescent dentin; however, the crowns of the teeth did not appear "blocky" with the constriction in the cervical region typical in this condition. Neither were the teeth opalescent in color.

Some consideration was given to the possibility that the teeth were erupting and shedding prematurely because there was no well-developed cementum with which the periodontal membrane could become well associated, a factor which, to be sure, is necessary for adequate stabilization and anchorage of a tooth. The possibility that the teeth were developing so rapidly that well-defined primary cementum was not afforded sufficient time to be deposited was also considered. It would seem unlikely that the cementum was torn from the root when these teeth were removed because this was a relatively nontraumatic experience. Next, the probability that the seeming absence of primary cementum lining the roots of recently erupted teeth was a normal state of affairs was considered. To test this possibility, recently erupted teeth extracted from the jaws of other patients were studied microscopically for the presence or absence of cementum. In these cases a thin layer of primary cementum was found. Kronfeld states that when the tooth erupts, the cementum has already attained a certain thickness.[1] Because of the seeming dearth of cementum lining the roots of these teeth, it was thought

1. Kronfeld, Rudolf. Histopathology of the teeth and their surrounding structures. Philadelphia, Lea & Febiger, 1939.

that this case might be an example of cementogenesis imperfecta.

The fact that cementum was practically absent on the root surfaces of the teeth examined microscopically may have accounted for the rapid eruption and sloughing of the teeth as has already been mentioned. The terminal fibrils of the periodontal membrane have little or no substance, that is, cementum, lining the root surface into which they can be securely anchored, so that adequate fixation and retention of the teeth in the jaws are not afforded. Hence, it would appear that the alveolar bone of the jaws behaves as if the teeth were foreign bodies, so that some of them, especially those which have little or no cementum and those which have not become ankylosed, are exfoliated.

The role of the dentist in the detection and diagnosis of oral malignancies

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The dentist has a distinct obligation to use every scientific means at his disposal in the detection and diagnosis of oral tumors. The necessary knowledge and the technics of securing biopsy specimens and associated clinical data must, therefore, be considered an integral part of his professional responsibilities in meeting the challenge of neoplastic disease.[1]

The role of the dental profession in detection of oral cancer is being increasingly amplified. It is stated that over thirty thousand potential cancer deaths may be prevented during the next decade through early diagnosis by the dentist, followed by proper surgical or radiation therapy by the physician.[1]

Careful examination and clinical evaluation of any minor abnormalities in the oral mucosa and associated structures must be the rule, since advanced carcinomas, which are more easily recognized, obviously have less chance for satisfactory treatment.[2] Both the dentist and the physician should be aware that in the oral cavity carcinoma is a pathological chameleon often hidden by or confused with the inflammatory, degenerative and traumatic diseases frequently seen in everyday practice.

While the taking of a tissue specimen for microscopic examination and the assembly of the clinical data are relatively simple procedures, these are the procedures most frequently neglected by the general practitioner. Since the general practitioners constitute the vast majority of the profession, the need for emphasis

Presented in the clinical program, Arkansas State Dental Association, Little Rock, Ark., April 8, 1953.

1. Robinson, H. B. G. Diagnosis of cancer of the oral mucosa. Oral Surg., Oral Med. & Oral Path. 4:985 Aug. 1951.
2. Bernier, J. L., and Tiecke, R. W. The biopsy. J. Oral Surg. 8:342 Oct. 1950.

on, understanding of and systematic reflection on this problem becomes apparent.

The use of the biopsy as a diagnostic aid is by no means limited to suspected malignant changes, but is invaluable in differentiating some of the inflammatory and degenerative processes encountered in oral pathologic conditions.[3] As in cavity preparation, an orderly procedure is mandatory; each step must be executed to provide maximum information.

CLINICAL EVALUATION

Any ulceration or swelling of the oral mucosa or associated structures which does not respond to conservative treatment over a two weeks' period should be considered suspicious and evaluated on the basis of the patient's history and a clinical examination. The history obtained from the patient should include the following data:

1. Age.
2. Sex.
3. Pertinent medical history.
4. Name of family physician.
5. Approximate date that patient was first aware of the lesion.
6. Subjective symptoms, including pain, temperature, bleeding, loss of function, and paresthesia.
7. Adjoining regions of chronic irritation and possible cause of such irritation: excessive or persistent use of tobacco, ill-fitting or poorly contoured dental restorations or appliances, poor oral hygiene or continuous use of caustic or astringent oral medications.
8. Name of any other physician or dentist consulted in regard to the lesion and approximate date of examination.

In the clinical examination, the following data should be ascertained by inspection and palpation of suspicious lesions or regions:

1. Size of lesion or lesions expressed in centimeters or millimeters.
2. Consistency of lesion. The consistency of the lesion—hard, soft or fluctuant—often indicates the true character of the process and aids in the establishment of a positive diagnosis.
3. Anatomical location and pathological characteristics.

In the determination of the pathological nature of the lesion, a number of frequently observed characteristics are useful criteria. Goldman[4] describes early cancer of the oral mucosa as a small ulcerated lesion red or reddish yellow in color with a ragged granular appearance. In this early stage the lesion may not show induration or the so-called "stony hardness"; this condition then usually develops as the tumor assumes its more advanced form and either the infiltrative or the outward proliferative characteristic becomes apparent. In most instances, pain associated with oral carcinoma results from secondary infection rather than from invasion of, or pressure of the tumor on, nerve tissue. It is well to remember that the infiltrative or erosive carcinoma of the gingiva often proliferates along the periodontal membrane and may be manifested clinically by a sudden loosening of the affected tooth.[5] Extraction in such instances is contraindicated because of the possibility of retarded healing and metastasis before a positive diagnosis of malignancy can be established.

Leukoplakia, with its varied clinical patterns and locations, must be observed periodically; and if there is a tendency for thickening, elevation, ulceration or fissuring, positive steps must be instituted to determine the nature of pathologic

3. Orban, Balint. Lectures in periodontology. Colorado Foundation for Dental Science, June 1951.
4. Goldman, L. B. Cancer and the dentist. J.A.D.A. 42:371 April 1951.
5. Waldron, C. A. The dentist and cancer. Washington Univ. D. J. 18:57 Nov. 1951.

progress. Since early or benign leukoplakia is constantly seen, the practitioner must be careful not to be overzealous and produce a "cancer phobia" in the patient. Nevertheless, in suspicious cases, an intelligent appraisal of the problem should be presented by the dentist and understood by the patient.

The question is often raised as to the possibility of the spread of a cancer as a result of taking specimens for biopsies. While theoretically the production of a metastasis by such a procedure is a possibility, the tissue specimen is indispensable in determining the nature of the tumor and the character of the cells, and the information thus obtained is invaluable in planning radiation or surgical treatment.[1, 2, 5, 6]

PREOPERATIVE PROCEDURE

Anesthesia • Procaine or one of the procaine derivatives, as routinely used in dentistry, is the anesthetic of choice. The injection should not be made directly into the lesion but peripherally to reduce the possibility of cellular distortion.

The use of ethyl chloride as a local anesthetic is contraindicated, since its refrigerant action produces tissue and cellular deterioration.

Topical Antisepsis • Seventy per cent alcohol as a topical antiseptic is recommended; the tinted antiseptics hinder subsequent staining technics.

REMOVAL OF THE SPECIMEN

There are many technics for the removal of the tissue specimen, but in the vast majority of cases surgical excision or incision is the method of choice.[1, 2] The use of punch forceps and of aspiration technics is of value in securing tissue from inaccessible regions, but the fragmentation and crushing of the specimen which result from this method make the diagnosis more difficult.

Surgical Technic • Pathologists agree that the use of a sharp scalpel where it is possible delivers the specimen in its most undistorted form. Since the pathologist is entrusted with the responsibility of correlating the clinical and histopathological patterns, every procedure that facilitates proper diagnosis should be followed. The oral pathologist should be consulted if possible, since the bizarre and complex patterns of oral disease require a most thorough evaluation and differentiation.

When the lesion is small and superficially located, removal by total excision is recommended. The operator must be careful to include a definite zone of normal tissue along the border of the lesion. The mass should be removed without being crushed; then it should be rinsed and placed immediately in the fixative. The placement of sutures in the more vascular regions is advised before the excision is completed, so that rapid closure of the wound may be effected.

If because of the size or the location of the lesion complete removal is not possible, a specimen should be incised from the lesion. Bernier and Tiecke[2] suggest that a triangular incision should be made at the edge of the lesion to include a portion of the normal tissue. The apex of the incision should extend below the deepest part of the affected region. In the selection of the site of the specimen the most representative portion of the lesion should be chosen.

A nonserrated tissue forceps is used to grasp the specimen and to free it gently from its base. Extreme care must be exercised to avoid crushing or mutilation of the tissue. The specimen is then rinsed momentarily in cold tap water and immediately deposited in the fixative. Sutures are placed to promote healing and to control hemorrhage.

An incision should not be made into a

6. Stoopack, J. C. Biopsy techniques. D.D.S. 2:176 March 1953.

suspected melanoma for biopsy purposes, but the lesion should be removed in its entirety along with a good border of surrounding tissue. This procedure is necessitated by the early and diffuse nature of metastasis from such tumors.[7]

Fixative • Ten per cent Formalin is the fixative of choice, and the specimen bottle should be of wide-mouth design. Sufficient fixative should be used to equal at least ten times the volume of the tissue to be examined.

ASSEMBLY OF DATA

A careful review of the assembled data is imperative to see that all pertinent details relative to the case have been secured. The collected material, which should include roentgenograms where necessary, is forwarded to the pathologist for diagnosis.

While the biopsy is a most essential diagnostic aid, a negative report from the pathologist should not be accepted as final if the region in question does not yield to treatment or gives evidence of recurrence.[8] Repeated biopsies often are necessary along with consultations with the pathologist for suggestions in regard to securing a more representative specimen. Once the diagnosis of cancer has been made, the patient should be referred immediately for medical consultation. In every instance, it should be ascertained whether the patient reported for consultation.

There are few diagnoses as important as the early recognition of cancer, since the life of the patient often hangs in the balance. The dentist has not only the legal right but the moral obligation to play an essential role in the detection and diagnosis of this grave disease.

SUMMARY

1. Careful examination of the entire oral cavity must be a routine procedure for the general practitioner.

2. Suspicious lesions should be evaluated thoroughly and a tissue specimen secured if a favorable response is not obtained after conservative treatment.

3. The biopsy should be planned to insure that a sufficient and representative specimen is obtained.

4. Small lesions should be totally excised.

5. Pertinent history and a careful clinical evaluation of the lesion to be examined should be submitted to the pathologist.

6. The specimen should be placed in an adequate amount of fixative immediately on removal.

7. Repeated biopsies are necessary if progression or recurrence of a lesion is suspected.

8. When the diagnosis of cancer has been confirmed, immediate referral to a competent medical practitioner must be made. It should be ascertained whether the patient reported for consultation.

217-219 State National Bank Building

7. Kerr, D. A. Biopsy as an aid to diagnosis. J. Michigan D. A. 34:22 Feb. 1952.

8. Sarnat, B. G., and Schour, Isaac. Oral and facial cancer. Chicago, Year Book Publishers, 1950.

Weapons of the Mind • From the hour of the invention of printing, books, and not kings, were to rule the world. Weapons forged in the mind, keen edged, and brighter than a sunbeam, were to supplant the sword and battle ax. *Whipple.*

Trichloroethylene in dentistry: general anesthesia

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The vast majority of dental and oral surgical procedures are carried out in the dentist's office under some form of analgesia. Local analgesia is most commonly employed; but general analgesia may be used, obtained with nitrous oxide or, as lately, with trichloroethylene. A recent paper[1] presented a detailed discussion of the role of trichloroethylene as an analgesic in dental practice; the chemical and pharmacological properties of the agent likewise were discussed.

There are a number of conditions, however, for which analgesia of any type cannot be employed satisfactorily. When local analgesia is contraindicated because of the kind or extent of the operative procedure, when there is inflammation from any other disease along the needle's path or when anatomical anomalies render a nerve block impractical, it becomes necessary to administer a general anesthetic in the office. General anesthesia may be required also when an operation is to be performed on young children; on extremely apprehensive or uncooperative adults; on mentally defective, psychotic or psychoneurotic individuals; or on patients who refuse local analgesia or who have a history of previous reactions to local analgesic agents.[2]

General anesthesia of any kind definitely increases the hazard of an operation when it is to be carried out in the office. Among the dangers are obstruction to free breathing; aspiration of debris, blood or vomitus; cardiovascular complications; and prolonged and incomplete recovery. Any of these complications may place the patient in jeopardy even after he has actually left the dentist's office. The employment of general anesthesia requires special equipment and drugs and above all an anesthetist skilled in the administration of a general anesthetic who is aware of the problems in this special field and who knows the indications and the uses of the drugs for the management of complications. It is highly desirable also that there should be a place where patients may rest after the operation under competent observation until they recover fully from the effects of anesthesia.

An agent or technic in order to be safe and usable in office practice should fulfill the following requirements: (1) Induction and recovery should be fast, pleasant and unattended by nausea and vomiting. (2) The agent should have a minimum of undesirable or disturbing effects on the various functions of the body. (3) The agent should be potent enough to allow for first plane surgical

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Supplies of trichloroethylene, dental anesthesia apparatus and trichloroethylene vaporizers were supplied by the Ohio Chemical and Surgical Equipment Co.

1. Sadove, Max S.; Wyant, Gordon M., and Spence, John M. Trichloroethylene in dentistry: general analgesia. J.A.D.A. 47:661 Dec. 1953.

2. Sadove, M. S., and others. Classification and management of reactions to local anesthetic agents. J.A.M.A. 148:17 Jan. 5, 1952.

anesthesia for any patient without need for heavy premedication or reduction of oxygen below the minimum requirements of the body. (4) The agent should be relatively nontoxic. (5) It should be easily controllable. (6) It should be nonflammable and nonexplosive. (7) It should be easily stored and stable. (8) It should be economical in use; the equipment for its use should be simple and require little maintenance.

Until recently these requirements were most closely approached by nitrous oxide-oxygen anesthesia, often supplemented by other agents. Nitrous oxide is a weak anesthetic agent; unless it is supplemented, maintenance of anesthesia is difficult, and in some robust individuals anesthesia cannot be induced at all with this agent alone without either reducing oxygen to hypoxic concentrations or else administering fairly heavy premedication. Both of these factors are undesirable; hypoxia disturbs the normal functions of the body and if extreme may cause severe physical or mental damage and even death. It causes muscle rigidity such that the rigid muscles of mastication interfere with adequate exposure of the field of operation, and it increases the incidence of postoperative nausea and vomiting. Heavy premedication delays recovery from anesthesia and necessitates close supervision of the patients during the preoperative and the postoperative periods, which in turn increases the need for personnel charged with the care of these patients. Finally, by necessitating the occupation of valuable office space, it diminishes the number of patients who can be seen and treated.

In order to potentiate the anesthetic action of nitrous oxide, diethyl ether or divinyl ether has been used as a supplement to the anesthetic mixture. Such mixtures are flammable and thus are especially hazardous in office practice; they increase salivation and possess a rather strong odor which may remain on the patient's breath for some time. In addition, they may pervade the office and be objectionable to other patients. Diethyl ether is irritating to the respiratory mucosa, and its addition to nitrous oxide may cause paroxysms of coughing unless great care is taken to ensure slow and gradual increase of concentrations. Induction with a nitrous oxide-ether sequence requires particular skill to use for the robust patient for whom potentiation of nitrous oxide is needed most. Recovery may be delayed, and there may be instances of nausea and vomiting. Divinyl ether is potent and rapid-acting, but a somewhat toxic agent. The drug is expensive, masseter muscle spasms and "running movements" are common during anesthesia, and nausea is a frequent postanesthetic sequel. It is easy to give an overdose of the drug, particularly when it is employed for the maintenance of anesthesia; overdosage may lead to respiratory arrest and cardiovascular complications.

Thiopental sodium has been used extensively in dental office practice. Such anesthesia is fraught with great hazards, and the practice cannot be accepted on a basis of good or safe anesthetic principles. Much has been written of the uses of this agent in the dental office, and the alleged advantages and safety of the method have been eulogized. What actually has occurred is that the administrators have simply "got by" with a hazardous technic, making their repetition of mistakes constitute experience. Such an interpretation of clinical results does not make an unsafe method safe, nor does it disprove established physiological, pharmacological and technical facts.

By the addition of small amounts of trichloroethylene to nitrous oxide it is possible to create a mixture of sufficient potency to obviate the disadvantages of nitrous oxide without at the same time reducing the speed of recovery from anesthesia or increasing the incidence of undesirable side effects and sequelae.

As a basis for the discussion of the use of trichloroethylene in dental anesthesia, the following summary is given of its pharmacological actions and the extent to which they affect the anesthetic technic and procedure:

CHEMISTRY AND PHARMACOLOGY	CLINICAL APPLICATION
1. Trichloroethylene is incompatible with soda lime.[3]	1. Trichloroethylene cannot be administered in a closed system with carbon dioxide absorption.
2. Trichloroethylene anesthesia may be accompanied by dangerous cardiac disturbances if vasoconstrictors of a dihydroxyphenylamine structure are injected simultaneously.	2. Epinephrine, norepinephrine (Levophed) and nordefrin (Cobefrin) must not be employed for local vasoconstriction. Phenylephrine (Neo-Synephrine) is probably safe.
3. Trichloroethylene is nonflammable and nonexplosive in air and also in clinical concentrations with oxygen.[4]	3. No explosion hazard exists when trichloroethylene anesthesia is being administered.
4. Trichloroethylene is decomposed by light and heat with the formation of potentially toxic side products.	4. Electrocautery must not be used inside the mouth because of the resulting inhalation of breakdown products. The drug should be stored away from bright sunlight. Residues in the vaporizer should be discarded.
5. Trichloroethylene is relatively nontoxic in low concentrations; in high concentrations it may cause cardiac arrhythmias, tachypnea, tachycardia and later bradycardia. With deep anesthesia, there may be effects on liver, kidneys and other organs.	5. The drug should be employed in low concentrations. When it is so used in combination with nitrous oxide for general anesthesia, the resulting mixture is of very low toxicity.
6. Trichloroethylene is an extremely potent agent.	6. Special vaporizers are recommended which are capable of delivering the very small amounts of the agent required for anesthesia.
7. Elimination of trichloroethylene depends on duration and depth of anesthesia, since these factors determine the amount of the drug dissolved in the fatty tissues of the body from which it is slowly released.	7. Clinical recovery is rapid after a short period and a light plane of anesthesia; it may be prolonged after unduly deep or lengthy administration. Therefore, facilities for recovery in such cases must be available.
8. Trichloroethylene is compatible with all known inhalation anesthetic agents.	8. Any combination of trichloroethylene with other anesthetic agents is possible. For all practical purposes the nitrous oxide-trichloroethylene-oxygen sequence will not fail to provide adequate operating conditions for the oral surgeon in any case suitable for general anesthesia in the office.

3. Firth, J. B., and Stuckey, R. E. Decomposition of trilene in closed circuit anaesthesia. Lancet 1:814 June 30, 1945.

4. Thomas, G. J. Do you know? Fires and explosions. Newsletter, Am. Soc. Anesthesiologists 16:20 Dec. 1952.

APPARATUS

Any anesthesia machine capable of delivering a measurable quantity of nitrous oxide and of oxygen may be used for trichloroethylene anesthesia, after a vaporizer for trichloroethylene has been added to the apparatus. This vaporizer should be capable of delivering very small increments of the agent, up to a maximum concentration of 2 per cent. Because of the small amount of agent needed, the vaporizer should have no wick; neither should the gases be bubbled through the trichloroethylene, since this procedure might produce high concentrations. Vaporizers of the drip variety are not efficient because of the low volatility of trichloroethylene.

PREREQUISITES

Before it is decided to administer general anesthesia in the office, a number of prerequisites must be met. If they cannot be met, the patient should be admitted to the hospital and operated on under routine operating room conditions with all the ancillary facilities.

First, the patient's history is taken. This should include information regarding past and present diseases. It should be ascertained whether active treatment is being received at the moment or whether the condition has been cured. In this connection information on any type of drug treatment should be elicited, as for instance, past or present use of cortisone and the need for coronary dilators such as nitroglycerin. Special emphasis should be placed on the condition of the heart, lungs and kidneys. Previous operations and the patient's reactions to general anesthesia must be ascertained also. When postoperative complications have been encountered or when doubt exists as to the present state of past disease, the physician should be consulted and his advice sought on the safety of proceeding with office anesthesia. A rough estimate is made of the patient's physical state with special reference to such conditions as respiratory infections, cardiorespiratory disease and anemia. Information on such signs and symptoms as cough and sputum, shortness of breath at rest or on exertion, cyanosis, palpitations, swelling of ankles, fainting, precordial pain and pallor can be elicited easily; if present such symptoms call for medical consultation.

If the patient is found suitable for general anesthesia, he is given an appointment and is instructed, preferably by means of a printed instruction sheet, to come to the office accompanied by a responsible adult who will accompany him home also after the operation. He is informed that he must not drive a car himself after the anesthesia and that he should take no solid food for at least four hours before the time scheduled for the operation. He should empty his bowels and bladder immediately before the time of anesthesia. Preliminary cathartics and enemas are not needed. If oral premedication is indicated, the relevant order is included on the instruction sheet.

A competent anesthetist should be available; the surgeon should not act as his own anesthetist. In the case of female patients, regardless of age, a female witness must be present; this usually is the office nurse who at the same time may act as an assistant to the surgeon.

Apart from the usual equipment of a dental office, drugs and instruments for the diagnosis and treatment of complications and for resuscitation should be at hand. The instruments needed include adequate suction equipment, oral packs, airways, a clinical thermometer and a sphygmomanometer. The drugs include belladonna derivatives such as atropine or scopolamine, spirits of ammonia and agents to combat reactions to local anesthesia, which may be used in combination with general anesthesia.[2] If an anesthesiologist is employed for the administration of the anesthetic, he will have

available in addition analeptics, vasopressors, coronary dilators such as nitroglycerin and other drugs, a laryngoscope, a bronchoscope and endotracheal tubes.

A place for recovery must be available where the patient can be observed before he is sent home in the custody of the person who has accompanied him to the office. The patient is given a second instruction sheet containing his postoperative and postanesthetic orders.

GENERAL CONSIDERATIONS

However minor the operative procedure, general anesthesia in the dentist's office is major anesthesia. It requires special skill and experience to administer anesthesia in the correct light plane to an individual who is ambulatory and relatively unprepared and who is to be ambulatory again in the shortest period of time possible. At the same time this light anesthesia must be adequate for the specific surgical procedure during the short period of time when it is required and flexible enough to be increased or decreased as occasion demands. The oral surgeon has to do his work in the patient's airway and its immediate surroundings; often the surgeon, the patient and the anesthetist are making demands on the same area at the same time; the patient, so that he may breathe and live, the surgeon so that he may carry out the operation. Such a situation demands the utmost of skill and teamwork on the part of the dentist and the anesthetist, who for the time being is the guardian of the patient's airway. With good cooperation and understanding of each other's problems, these difficulties can always be overcome.

It must be remembered that the anesthesia advocated is one of nitrous oxide-oxygen, reinforced, as it were, with traces of trichloroethylene. It is not a trichloroethylene anesthetic; that is, trichloroethylene is not the main anesthetic agent but rather a supplement to the main anesthetic. Only thus are the advantages of the two agents utilized to the fullest extent, while their disadvantages are minimized or may even be entirely avoided.

MANAGEMENT OF ANESTHESIA

When the patient arrives at the office at the appointed hour, he is questioned regarding the time when he last took food or drink of any kind. He is asked to empty his bladder and bowels unless he has done so shortly before. Pulse and blood pressure are noted and recorded. In the rare instances when premedication is considered advisable, it is administered at this time. Premedication must be correct in type, dosage and timing and should be administered by hypodermic injection. Oral administration is not recommended because of the uncertainty of rate and degree of absorption. The peak of sedation with oral barbiturates, for instance, is not reached for approximately two hours; hence these agents are taken at least two hours before the scheduled time of operation, preferably before the patient's arrival in the office in order to avoid a long period of waiting. Furthermore, the sips of water usually needed to swallow the medication increase the danger of vomiting and aspiration during anesthesia. Absorption of hypodermic medication is much more predictable and also shorter (30-45 minutes). Before the patient is allowed in the dentist's room, the anesthetist checks tanks, flowmeters and connections of the anesthesia machine and lays out his equipment. He ascertains that no residual odor remains in his machine from previous administrations of trichloroethylene, ether or other agents.

When the surgeon and the anesthetist have completed all preparations, the patient is asked to step into the room, to loosen tight and constricting articles of clothing and to take his seat in the chair. He is told to assume a comfortable and

relaxed position in the chair, which has been placed in a semireclining position. Restraining straps may be applied loosely around the hips while the procedure is being explained to him. The authors have found straps unnecessary and do not use them any longer. Special care is taken to put the patient at ease in mind and body. To ensure this effect, the patient is addressed in a calm, reassuring voice; instruments are so arranged that they are hidden from his view; bright light is not allowed to shine into his face. A calm and relaxed attitude on the part of the patient is of the greatest importance as it greatly facilitates induction and maintenance of anesthesia. Pulse and blood pressure are rechecked; respiration is observed for rate, rhythm, depth and symmetry of chest movement. The surgeon now applies the customary drapes; and, all being in readiness, a mouth prop is inserted, as it frequently is difficult or unwise to do so after anesthesia has been induced because of the light plane of anesthesia and consequent absence of relaxation of jaw muscles.

The nasal inhaler is now placed into position but not connected to the anesthesia machine. The tubes are arranged so that they lie below the head support of the chair. The bag of the machine has already been filled with a nitrous oxide-oxygen mixture containing not less than 20 per cent oxygen. The rate of flow of the two gases is set at about 4 to 8 liters (1 to 2 gallons) per minute of nitrous oxide and 1 to 2 liters (¼ to ½ gallon) of oxygen. The nasal inhaler tubing is connected to the anesthesia machine, and the exhalation valve on the nasal mask is opened. The patient is instructed to breathe normally in a slow and regular manner; and after about ten breaths, administration of trichloroethylene is begun by moving just a trifle the lever controlling the percentage of trichloroethylene. Only this minimal amount of trichloroethylene should be given in order that the patient may not object to the odor and refuse to continue with the anesthesia. Every four to six breaths, the lever is advanced a fraction of a notch, so that the trichloroethylene is increased as rapidly as it is possible without irritating the respiratory tract, until satisfactory plane one surgical anesthesia is established. All through the induction the anesthetist speaks to the patient in a soothing and calming voice, assuring him that all is well and reminding him to breathe slowly and normally. No other conversation or noises are permitted, as these are often considerably exaggerated during the transition from consciousness to anesthesia with resulting excitement on the part of the patient.

Once surgical anesthesia of the first plane has been established, the trichloroethylene marker may be returned to position 2 or 3 depending on the patient and the length of the procedure. The flow of gases is increased to 2½ to 3 gallons per minute, while the 80:20 proportion of nitrous oxide and oxygen is maintained. It must be remembered, however, that this increase in flow dilutes the concentration of trichloroethylene in the mixture. The surgeon may now proceed with the operation.

An oropharyngeal pack is now placed by the operator. The correct position of this pack is of great importance. It should be placed in the region of the anterior tonsillar pillars and should be substantial enough to prevent both aspiration of blood and debris and dilution of the anesthetic mixture by the air which enters the mouth. In these functions the pack is aided by the increased rate of flow of the gas mixture. If it is placed too far back, the pack will interfere with the free exchange of gases between the nasal cavity and the lungs at the level of the oropharynx.

While the anesthesia is in progress, from induction to emergence, the anesthetist never takes his eye off the patient.

He keeps one finger constantly over the superficial temporal artery, thus checking the pulse for rate, fullness and regularity. In operations on the mandible, he supports the bone by forward pressure from behind the angle of the jaw, thus counteracting the pressure exerted by the surgeon, which tends to obstruct respiration. At all times the anesthetist holds the patient's head firmly on the headrest. He watches the flowmeters and the breathing bag of the machine and follows closely the progress of the operation so that he may anticipate the anesthetic needs of the surgeon. Swallowing is a sign of lightness of anesthesia and calls for increased amounts of trichloroethylene. Usually the patient's face shows a light flush and a little perspiration. Cyanosis is valueless as a sign since hypoxia may exist in its absence. In operations exceeding ten minutes, blood pressure readings are taken at intervals of five minutes. If the procedure is a short one, such as the uncomplicated extraction of one tooth, the trichloroethylene may be discontinued shortly after the start of the operation. In longer procedures it is continued, but usually the amount of the agent can be reduced gradually and is discontinued one or two minutes before the estimated termination of the operation; thereafter only nitrous oxide-oxygen is administered until the procedure is completed.

At the termination of the operation, the pack and nasal inhaler are removed, and the patient is allowed to breathe room air. The mouth prop is left *in situ*, however, and a hemostatic pack is placed in the socket of each extracted tooth. While the effect of the anesthetic is slowly dissipated, the patient passes through a phase of increased vomiting activity, commonly preceded by swallowing movements. Great care is exercised at this point to ensure that vomiting or regurgitation does not occur and, if it does, that the material is promptly sucked away so that it will not be aspirated into the lungs. As the patient emerges from anesthesia, he is spoken to gently and assured that all is well and that the operation has been completed. This procedure increases greatly the smoothness of emergence and diminishes the excitement of reorientation since it assists in bringing the patient smoothly back into contact with his environment. After he is fully awake, the patient is allowed to rest in the chair for two to three minutes before he is allowed on his feet. Whether he is left sitting in the chair afterwards or placed on a couch in a room set aside for recovery depends on the facilities of the individual office, but under no circumstances must he move to the couch unaided. Although the patient may feel and look well at the termination of the operation, a syncope may develop if he is allowed on his feet too soon or too abruptly. Emergence is usually accompanied for a short period by pallor, which replaces the flush observed during anesthesia. While the patient is resting, an attendant remains within calling distance, and emergency equipment is kept on hand.

TRICHLOROETHYLENE ANESTHESIA FOR CHILDREN

For children between the ages of two and six years a different technic may be employed for trichloroethylene anesthesia. These young patients require little anesthetic agent of any kind for the attainment and maintenance of plane one general anesthesia. At the University of Illinois a special analgesia inhaler has been adapted for use in the dental clinic.[1] Inhalers of this type, though not designed for anesthesia, readily deliver concentrations of trichloroethylene which are anesthetic for children. For children in these age groups a trichloroethylene-air mixture is administered. During the procedure, the anesthetist

must be mindful of the ease with which an overdose can be administered with this apparatus, and minute amounts only should be given. The method has its greatest usefulness in procedures not exceeding two to three minutes.

TRICHLOROETHYLENE FOR HOSPITALIZED PATIENTS

In oral surgery in the hospital operating room, trichloroethylene as an adjunct to nitrous oxide has a definite place. In the operative work of the authors, for those cases where its use is indicated, this type of anesthesia has practically superseded all other kinds of anesthesia. The patients are given the same premedication as other surgical patients, preferably after admission the previous night. Endotracheal intubation is carried out after induction with thiopental sodium has been completed and relaxation has been obtained with one of the shorter-acting muscle-relaxants. After the passage of the endotracheal tube, nitrous oxide is administered, supplemented by such small amounts of trichloroethylene as may be needed. This technic is used except in those cases for which the oral surgeon wishes to use epinephrine or a similar vasoconstrictor.

SUMMARY

Trichloroethylene possesses chemical and pharmacological properties which give the technic of the nitrous oxide-oxygen-trichloroethylene sequence of anesthesia advantages over other methods of anesthesia for use in the dental office.

One of the greatest of these advantages is the relative ease with which anesthesia can be induced and maintained without the danger of hypoxia. When the technic is followed correctly, those manifestations which are especially troublesome to the dentist, such as trismus, jactitations and excessive salivation, are rarely if ever encountered. From the patient's point of view, the absence of dreamlike states, the presence of residual analgesia and euphoria on awakening and the absence of nausea and vomiting are most appreciated. The whole procedure is much superior to that of nitrous oxide anesthesia with or without diethyl or divinyl ether supplementation, and for the dental office the anesthesia is much safer than thiopental sodium anesthesia.

The authors have used this technic both in office and in operating practice of oral surgery for the last year with most gratifying results. The technic merits wider trial and assessment.

Self-Help • Men are so inclined to content themselves with what is commonest; the spirit and the senses so easily grow dead to the impressions of the beautiful and perfect, that every one should study, by all methods, to nourish in his mind the faculty of feeling these things. . . . For this reason, one ought every day at least, to hear a little song, read a good poem, see a fine picture, and if it were possible, to speak a few reasonable words. *Goethe.*

The effect of preheating on thermal expansion of silica-gypsum investments

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Ever since the adoption of an inlay casting investment specification by the American Dental Association in 1930, the thermal expansion compensation technic has been used extensively in the casting of dental restorations.

The addition of boric acid by Weinstein in 1929[1] and sodium chloride by Moore in 1933[2] to quartz-plaster investments and the development of an investment containing cristobalite in 1933[3, 4] have done away with investments that shrink when they are heated. Various technics for precision dental casting have been introduced from time to time, but none are as widely used as the thermal expansion compensation technic. Yet, despite its favor and usage over a period of twenty-odd years and despite the fact that it has been investigated for a still longer period of time, the technic contains some unexplained variables. The purpose of this investigation has been to obtain information on one such variable in investments; namely, the effect produced by drying at elevated temperatures and then cooling prior to the normal continuous burnout procedure. In some investments the subsequent thermal expansion is increased, and in others the thermal expansion is decreased. Such changes can affect critically the results in precision casting, and it is therefore important to recognize and evaluate these changes.

PROCEDURE

The following investments were used in this study:

Material	*Manufacturer*
Cristobalite Model Investment	Kerr Manufacturing Company
Pyromold No. 2 Investment	William Getz Corporation
R & Gray Investment	Ransom & Randolph Company

All investment specimens and molds used in the investigation were mixed according to the manufacturer's recommendation for water-powder ratio, with room temperature tap water, and were mechanically spatulated and vibrated.

The thermal expansions of the investments and the changes in length resulting from the preheating and cooling cycle were determined by the use of the fused quartz tube apparatus as described by Hidnert and Sweeney.[5] The tempera-

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2. U. S. Patent No. 1, 924, 874.
3. U. S. Patent No. 1, 932, 202.
4. Sweeney, William T. Cristobalite for dental investment. J.A.D.A. 20:108 Jan. 1933.
5. Hidnert, Peter, and Sweeney, W. T. Thermal expansion of magnesium and some of its alloys. J. Res. NBS 1:771, 1928.

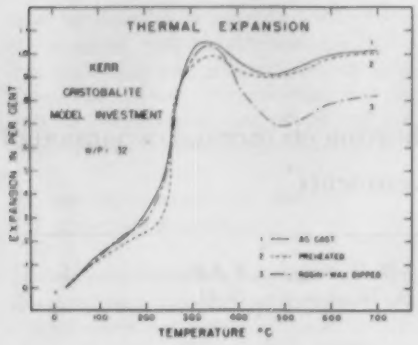


Fig. 1 • Thermal expansion of dental investment

ture of the specimen was measured with an iron-constantan thermocouple, the junction being placed in the center of the specimen. Specimens were heated at a rate of approximately 10°C. per minute. Setting expansions of the three investments were determined by the comparator microscope method described by Coleman.[6]

In addition to the investigation of commercial investments, thermal expansion data were obtained on plaster and hydrocal as received and, with the addition of two common constituents of dental investments, sodium chloride and boric acid. These materials were studied by roentgen-ray diffraction and petrographic methods before and after heating.

Partial denture and MOD inlay castings were made by conventional dental procedures with various combinations of the investments studied. The partial denture castings were examined for fin formation. Dimensional accuracy was evaluated by placing the inlay castings on MOD steel dies.

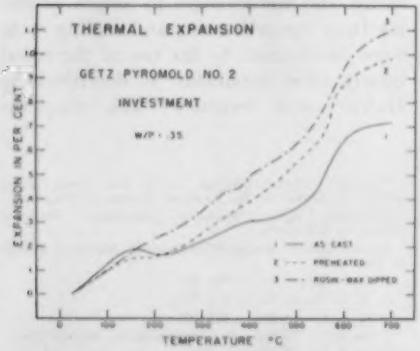


Fig. 2 • Thermal expansion of dental investment

RESULTS AND DISCUSSION

Thermal Expansion • The dimensional changes caused by heating are represented graphically in Figures 1, 2 and 3 by the curves marked: As cast, 1. In all cases the values are the averages of several tests. The individual values varied from the average by less than 0.1 per cent in most specimens. Drying the specimens at 120°C. for three hours and then cooling them to room temperature before heating in the thermal expansion apparatus did not affect the thermal expansion of one investment, increased the thermal expansion of another and decreased the expansion of the third investment, as is shown by the curves marked: Preheated, 2. This heat treatment simulates one used by prosthetic laboratories for drying investment casts prior to waxing up a partial denture framework pattern.

It is also common procedure in some prosthetic laboratories to dip investment casts into a mixture of rosin and wax at 150 to 165°C. after drying, to facilitate the adhesion of patterns to the cast. A series of specimens treated in a like manner exhibited thermal expansions as represented in Figures 1, 2 and 3 by the curves marked: Rosin-wax dipped, 3. It will be noted that in Figures 2 and 3

6. Coleman, R. L. Physical properties of dental materials. J. Res. NBS 1:867, 1928.

the expansion curves of the preheated and the rosin-wax dipped specimens are relatively the same, so that it is evident that the change in thermal expansion properties is a result of the preheating.

The fact that the thermal expansion of the rosin-wax dipped specimen in Figure 1 is unlike that of the preheated specimen cannot be explained at this time.

Change in Length as a Result of Preheating • It has been suggested that the change in thermal expansion of these investments is due to the loss of water during the preheat treatment. It has been demonstrated by Weiser and others[7] that the dehydration of $CaSO_4 \cdot 2H_2O$ follows definite steps; above 100°C. the $CaSO_4$ is in the hemihydrate form. Sweeney and Taylor[8] have shown that the loss of water in the crystallization of gypsum products is accompanied by a loss in linear dimension. Specimens of the three investments heated at 120°C. for three hours and cooled to room temperature exhibited the following changes in length:

Material	*Change in length*
Cristobalite Model	%
Investment	±0.00
Pyromold No. 2	
Investment	—0.04
R & R Gray Investment	—0.10

These are the average values of four specimens on which the measurements are accurate to 0.02 per cent. There is no apparent correlation between the dimensional change caused by preheating and the differential thermal expansion.

Setting Expansion • Setting expansions of the three investments determined by the comparator microscope method described by Coleman[6] were as follows:

Material	*Setting expansion*
Cristobalite Model	%
Investment	0.21
Pyromold No. 2	
Investment	0.26
R & R Gray Investment	0.21

Whether or not the full setting expansion is effective in compensating partially for casting shrinkage of gold is controversial. With these materials, however, this factor will not appreciably affect the total expansion obtained because all the setting expansion values are very nearly the same.

Effects of Composition • A chemical analysis, Table 1, shows the amounts of boric acid and sodium chloride used in these investments. Since boric acid and sodium chloride are more reactive than silica, it is thought that they react with the calcium sulfate of the investments. Therefore, the effect of these materials on the thermal expansion of plaster and hydrocal was studied. Approximately the same ratio of boric acid or sodium chloride to gypsum present in the investments was added to the plaster and hydrocal. Figure 4 shows the thermal expansions of French's plaster and R & R Castone, as received, with the addition

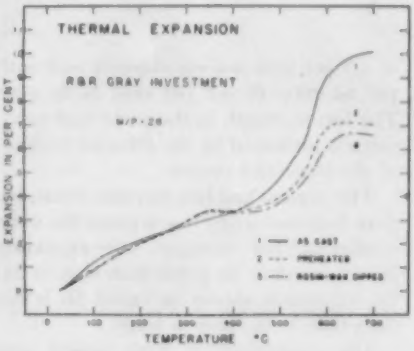


Fig. 3 • Thermal expansion of dental investment

7. Weiser, Harry B.; Milligan, W. O., and Ekholm, W. C. Mechanism of the dehydration of calcium sulfate hemihydrate. J. Am. Chem. Soc. 58:1261 July 1936.

8. Sweeney, W. T., and Taylor, D. F. Dimensional changes in dental stone and plaster. J. D. Res. 29:749 Dec. 1950.

Table 1 • Chemical analysis of investments

Investment brand	Insoluble siliceous matter	R_2O_3*	Ca	SO_4	Mg	Combined H_2O	H_3BO_3	NaCl
	%	%	%	%	%	%	%	%
Cristobalite Model	61.0	trace	10.6	25.5	0.2	2.4	0.02	0.02
Pyromold No. 2	58.3	0.5	10.7	25.7	0.3	2.6	2.0	Not detected
R & R Gray	54.6	trace	12.3	29.7	0.2	2.7	Not detected	0.62

*Oxides of elements which may be precipitated by ammonium hydroxide, such as iron, aluminum and titanium.

of 1.5 per cent sodium chloride and with the addition of 5.2 per cent boric acid. The loss in length in the preheated specimens is indicated by the fiducial readings of the respective curves.

The plaster had less thermal expansion than hydrocal when it was given the same treatment. For example, the expansion shown in curve 1a is less than that in 2a; the expansion shown in curve 3b is less than that in 4b; and so forth.

The expansions of both plaster and hydrocal were increased very slightly by the addition of 1.5 per cent sodium chloride (Fig. 4); however, the preheating did not affect the shapes of these expansion curves significantly, although a shrinkage did occur during the preheating cycle.

The effect of adding 5.2 per cent boric acid on the thermal expansions of plaster and hydrocal is quite evident. The loss in length of the specimens due to preheating was less, and the specimens withstood a much higher temperature without deterioration. The expansion of plaster and hydrocal containing the boric acid was greater than that of the as-received materials at almost all temperatures measured (Fig. 4). The most significant effect of the addition of boric acid was to increase the temperature to which the specimens that had been preheated could be heated before loss of strength occurred. This result is in agreement with the work of Coleman,[6] who noted that the addition of boric acid to silica-gypsum investments caused an increase in strength at elevated temperatures.

In an attempt to correlate the expansion data obtained with changes in crystallographic structure, the specimens represented in Figure 4 were subjected to roentgen-ray diffraction (powder) and petrographic analysis. The data obtained from this preliminary crystallographic study did not show significant differences and were not helpful in explaining the effect of preheating on thermal expansion of the samples studied. Since the cause of the difference in thermal expansion is yet unknown, however, a more detailed crystal analysis may be desirable.

Experimental Castings • In order to determine the immediate practical significance of the changes in thermal expansion properties produced by preheating, technic partial denture castings were made. A basic set of 18 castings were made with the three investments. Six casts of each investment were poured, three of which were dried at 120° C. for three hours and dipped in a rosin-wax mixture, consisting of 75 per cent commercial lump rosin and 25 per cent

paraffin, at 155° C. for 30 seconds. After waxing up the patterns, one cast without treatment was invested in each of the three investments; and one cast with the drying and dipping treatment was invested in each of the three investments. In this manner, different combinations of mold and cast thermal expansions were compared.

From these and many additional tech-

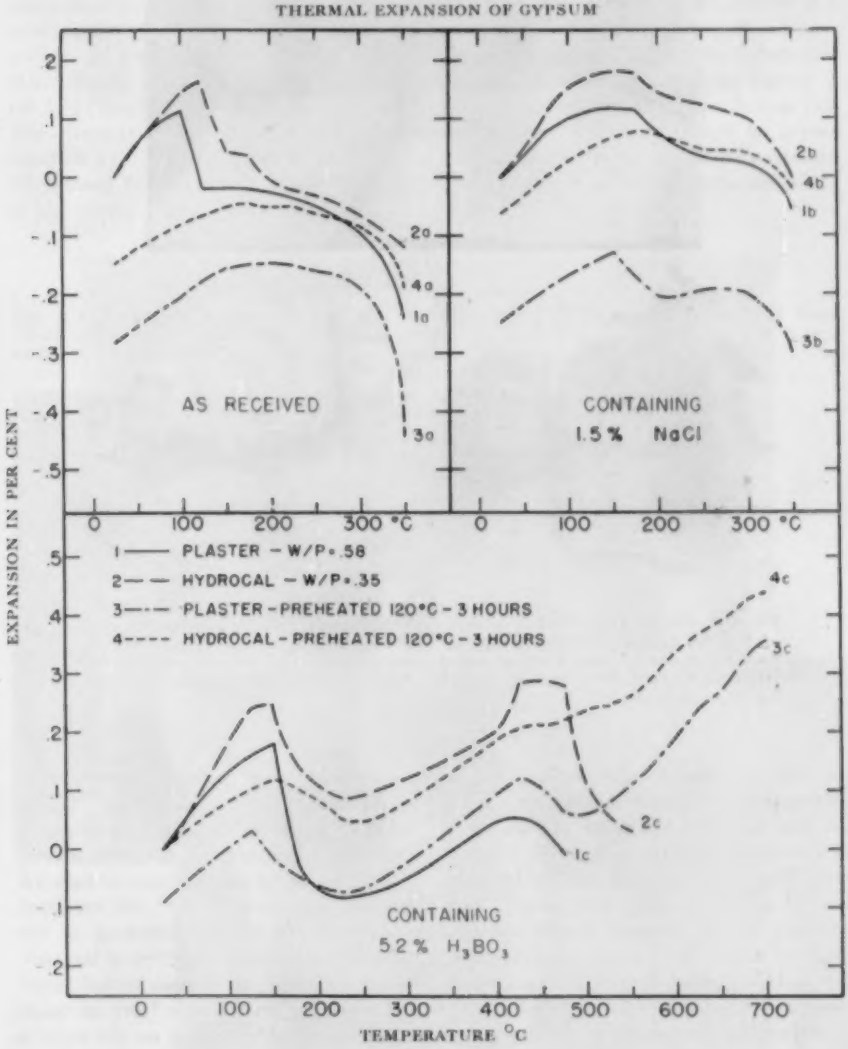


Fig. 4 • Thermal expansion of gypsum

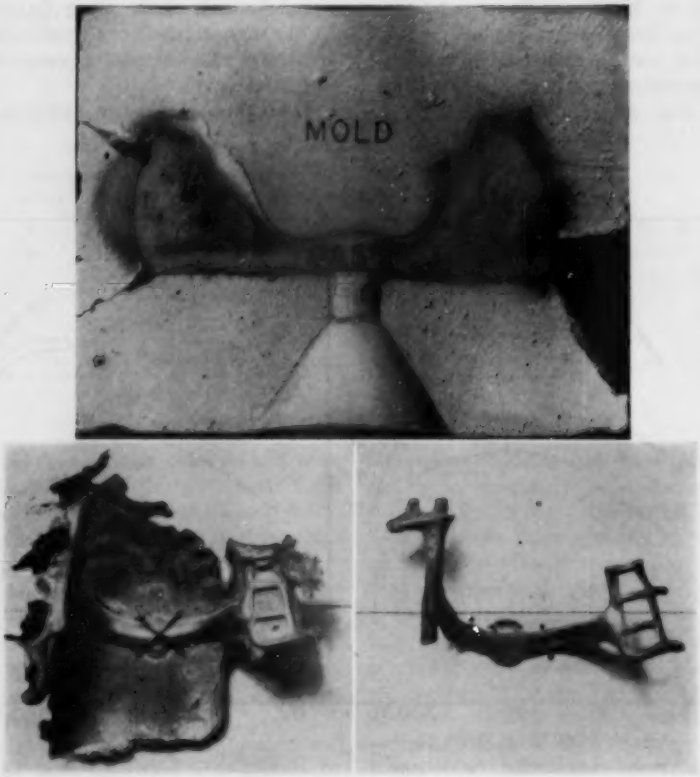


Fig. 5 • Above: Cross section of low-expansion mold and high-expansion cast after being heated to casting temperature. Note cracks at corners. Below: Technic castings made from identical wax patterns. Right shows satisfactory casting; left shows typical fin formation resulting from use of high-expanding cast and low-expanding mold

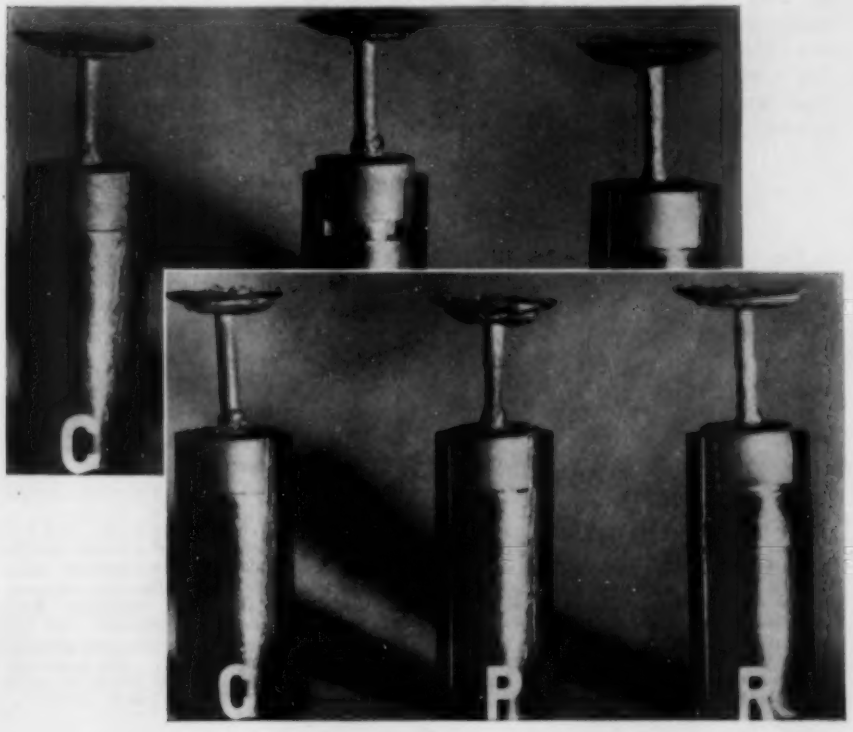
nic castings made by this technic, it was shown that if the thermal expansion of the cast exceeded the thermal expansion of the mold even by as little as 0.2 per cent, the mold cracked and a fin was formed on the casting. Conversely, and contrary to a common theory on the cause of fins, if the thermal expansion of the mold exceeded that of the cast by as much as 0.5 per cent, no fins were formed. It is therefore important to maintain like thermal expansions of the cast and the mold in casting partial denture frameworks to prevent casting failures due to fin formation.

Figure 5, above, shows a cross-sectioned mold and a partial-denture cast that were heated to casting temperature, so that the thermal expansion of the cast exceeded that of the mold. The cracking of the mold is evident at the corners of the cast. Figure 5, below, shows two technic castings made by this technic from identical wax patterns. The casting on the right is satisfactory; the casting on the left exhibits the typical fin formation resulting

from a high-expanding cast and low-expanding mold.

Castings made from patterns formed on MOD steel dies demonstrated that the dimensional accuracy of a casting can be affected by preheating alone. Figure 6, above, illustrates three MOD inlays in place on steel dies. The molds in this case were given the regular burnout procedure. It can be seen that castings C (Cristobalite Model Investment) and R (R & R GrayInvestment) fit the dies well. The thermal expansion of these investments is 1 per cent at 700° C. Casting P (Pyromold No. 2 Investment) does not fit the mold. The thermal expansion of this investment is 0.7 per cent at 700° C. Figure 6, below, shows three MOD inlays in place on the same steel dies, the molds of which were subjected to a 120° C. preheat treatment followed by cooling to room temperature prior to the regular burnout procedure. The fit of casting C remains unchanged; that of casting P is improved, and that of casting R is worse, as could be predicted from the differential thermal expansions shown in Figure 7. From these experiments it is obvious that the burnout procedure should be a continuous one in order to prevent changes in the thermal expansion properties of the mold.

Fig. 6 • Fit of MOD inlays on steel dies; C, Cristobalite; P, Pyromold; R, R & R Gray. Above: Molds given regular burnout. Below: Molds given preheating treatment at 120°C. and cooled to room temperature before regular burnout



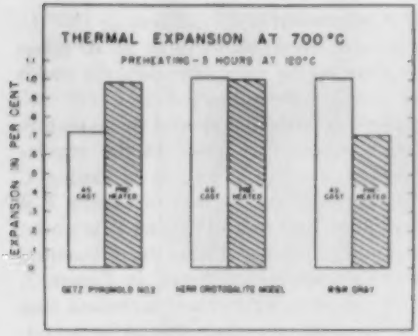


Fig. 7 • Effect of preheating on thermal expansion of three dental investments

SUMMARY

1. It has been observed that the thermal expansion of some casting investments is considerably changed by a preheat treatment consisting of heating the specimens of investments for three hours at 120° C. and then cooling them to room temperature.

2. Of the three investments studied, one showed an increase in the thermal expansion, another practically no change, and the third a decrease in thermal expansion.

3. The actual loss in dimension caused by the preheating of investments cannot be correlated with resulting changes in thermal expansion.

4. The thermal expansion changes due to preheating have been demonstrated to be one of the causes of fin formation in partial denture castings.

5. In clinical use investments should not be preheated unless specific information is available on the material being used.

The Scientific Generalist • The complexities of modern society have created the need for scientific generalists. . . . We often hear that "one man can no longer cover a broad enough field" and that "there is too much narrow specialization." . . . At all levels, decisions must be made which involve considerations of more than a single field. These difficulties are most pressing in the borderline fields like physical chemistry, chemical physics, biophysics, high polymers, and the application of chemistry, physics, and mathematics to medicine. . . . We need a simpler, more unified approach to scientific problems, we need men who can practice science—not a particular science—in a word, we need scientific generalists. . . . The generalist would naturally be concerned with system problems. These problems arise whenever parts are made into an integrated whole. *H. Bode, and others. Science, 109:553, 1949.*

COUNCIL ON DENTAL EDUCATION

Training programs for dental laboratory technicians

The Council's Committee on the Training of Dental Laboratory Technicians has prepared the following statement as a summary of some of the policies related to the accreditation of dental laboratory technology schools, and as an outline of some of the observations that have been made during the visits to schools now in operation.

AIMS AND OBJECTIVES

The general philosophy of the Council and its committee relative to the purpose of the two year program specified by the Council seems to be shared generally by the four dental laboratory schools which have been examined to date. The accredited programs are designed to provide the student with a broad general training that will acquaint him with most of the operations required in a dental laboratory, with the technical operations generally required by the dentists who use the services of a dental laboratory technician, with the basic knowledge required by one who eventually plans to establish a laboratory of his own or work for a group of dentists, and also with a complete understanding of the working relationship that must exist between the dentist and the dental laboratory technician. The suggested curriculum, as outlined in the Council's *Requirements for the Accrediting of a School for the Training of Dental Laboratory Technicians,* emphasizes the aims and objectives of the dental laboratory technician training programs and makes explicit the types of service to be rendered. It is generally acknowledged that the two year program is adequate to meet the aims and objectives as summarized, but it is not intended that the graduate of this two year course should possess the speed and skillfulness that he might have obtained by a program in which he would have been taught only a very limited number of technical operations.

RECRUITMENT OF APPLICANTS

Each of the schools individually and all of the schools collectively should increase their efforts to acquaint more qualified students with the opportunities of this technical field and in that way increase the reservoir of qualified applicants. Also the dental schools should acquaint potential students with this field of endeavor, for among the many applicants to dental school who are not admitted, there may be a sizable number who would be interested in laboratory work.

More high school counselors and advisers should be acquainted with the opportunities in this technical field, and additional schools should be started so that more regions may be served both from a standpoint of the students seeking

admission and also from the point of view of the profession which seeks persons with this type of training.

Some of the schools are already considering the administration of aptitude tests for the selection of students who will be able to complete the course satisfactorily and be successful dental laboratory technicians. As might be expected, a student's manual dexterity is extremely important, and it is also important that the student be able to achieve certain standards in his basic science courses, in courses such as English composition and in the cultural courses that are offered. This means that a student should have, in addition to manual dexterity, the ability to read rapidly and with understanding and to remember facts and to apply principles. Also he must be able to follow instructions. It is anticipated that a similar type of aptitude test battery will soon be available in all of the schools training dental laboratory technicians, and that these schools in turn will be able to indicate to the school counselors and advisers the relative importance of the qualifications listed.

CURRICULUM

The Council's requirements for the curriculum are relatively general. Although the Council expects a certain amount of uniformity in the curriculum, and certainly expects considerable uniformity in terms of the standards of achievement established for the graduates, the Council expects each school to exercise originality in the organization and in the content of its curriculum and its courses of study. Considerable individuality is evidenced in the schools in the methods of teaching and in the manner in which visual aids are employed.

The training of dental laboratory technicians is not an experiment, although some of the teaching methods and some of the curricula may be considered as such. The dental profession and the dental schools are interested in seeing this two year program which has been specified by the profession endorsed and promoted by more schools that agree with the philosophy and objectives of this type of training.

The two year program includes, in addition to technical training in a wide variety of operations, some courses in dental anatomy and gross anatomy. These are not intended to be duplicates of the courses given dental students. Instead, short, abbreviated courses are offered which will acquaint the dental laboratory technician student with some of the anatomical forms and structures to which the dentist is attaching, or against which he is placing, the prosthetic devices that are fabricated by the dental laboratory technician.

The dental anatomy course will give the student knowledge of tooth morphology and a knowledge of the position of teeth in the dental arch with regard to alignment, occlusion and relation to supporting structures sufficient to understand the specific requirements of the restorative appliance. The philosophy is that the dental laboratory technician can follow best the directions and wishes of the dentist for whom he is working if he understands more than just the routine steps of his procedures. Only in this way can an educational program prepare a student to perform work that is beyond the level of repetition or duplication, and only in this way can the student become competent to exercise judgment and to apply principles and procedures in new situations. The course in dental materials is given at a different level from that in gross anatomy and dental anatomy. Gross anatomy is usually a lecture course with some lecture-demonstration by the instructor; dental anatomy commonly includes lecture, lecture-demonstration and individual laboratory work. The course in dental materials also includes lecture, lecture-demonstration, and individual laboratory work, but the student is ex-

pected to acquire a detailed understanding of the topics discussed, whereas much less detailed knowledge would be expected in either gross or dental anatomy. For example, in dental materials, such topics as the physical and chemical properties of metals are studied intensively, since a thorough knowledge of these properties is invaluable to the technician in understanding the processing and fabricating of appliances that he makes. In addition, he will need this basic knowledge if he is to keep abreast of developments in laboratory work.

The courses for dental laboratory technicians differ in several ways from those offered the dental hygienists. Although at present the program for dental hygienists is a terminal course for many, some go on for further education and for a degree. The dental laboratory technician usually does not seek further formal training but considers this course terminal. Therefore, there are many more courses of a cultural type included in the dental hygiene program; also, more of the dental hygiene courses are designed so that they can be used for college credit toward a degree. The dental laboratory technician is not expected to have taken a college preparatory course in high school, but he must have graduated from high school. The courses for the student technician are taught at a "vocational school level" as opposed to a junior or senior college level for the dental hygiene program.

JUDICIAL COUNCIL

Ethics

ANNOUNCING START OF PRACTICE

Question • I am preparing to open an office for the practice of general dentistry. I would like to know the ethics of professional cards, announcements, and window signs.

A.C.A., New York

Reply • About window signs, we suggest you consult your local dental society Ethics Committee as usually each state has its own Dental Practice Act which regulates such signs, the size letter to be used, and so forth.

About the type card—we do not feel it necessary to use both Dr. and Dentist, or Dental Surgeon on the same card. Why not simply use: John Doe, D.D.S. Certainly the intelligent type patient you will have in your practice will understand that the D.D.S. after your name means Doctor of Dental Surgery. Such a card is always in good taste.

As you already have a copy of the *Principles of Ethics,* we would suggest you read Sections 13 and 15. May we suggest an announcement on a 4 x 6 card to read something like this: John Doe, D.D.S., announces the opening of his office, for the general practice of dentistry at (Address, City and State), Hours by Appointment, (Telephone Number). Your printer will suggest an attractive layout.

Judicial Council

COUNCIL ON DENTAL HEALTH

Recent actions of the Council on Dental Health

The Council on Dental Health of the American Dental Association at its second 1953 meeting November 23 and 24 took action regarding several aspects of dental public health as well as means for implementing the Council's program. Resolutions were adopted concerning financial support for dental health programs, the role of the dental profession in chronic illness, industrial dental health programs, proposed treatment studies being undertaken by the U. S. Public Health Service, approval of dental health education materials, conferences with other health agencies, the observance of National Children's Dental Health Day and the use of a fluoride mouthwash as a caries-preventive agent.

FEDERAL GRANTS-IN-AID

The Council reviewed all of the American Dental Association's policies with regard to federal grants-in-aid and adopted a statement, "The American Dental Association's Position on Federal Grants-in-Aid for Dental Health Programs," which will be submitted to THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION for publication as a Council report. The statement also will serve as background material for the Association in the presentation of testimony before Congressional committees.

STATE FINANCING OF DENTAL PROGRAMS

The Council sent to the House of Delegates a resolution that "constituent dental societies be urged to take immediate steps to strengthen the dental health programs in their respective states by (1) assuming the necessary leadership to secure the appropriation of state funds earmarked for dental health purposes, (2) fostering the appointment of a capable dental director and (3) aiding in the establishment of a sound administrative position for the state dental unit."

PREPAYMENT PLANS

The Council adopted a resolution advising constituent and component dental societies that "the most urgent need in the development of experimental prepayment dental care programs is for experience to determine in a specific community the feasibility, practicability and desirability of conducting such programs through already established facilities which usually are the offices of private dental practitioners."

INDUSTRIAL DENTAL HEALTH PROGRAMS

The Council adopted a resolution to continue to promote industrial dental health programs by (1) developing types of programs for industrial plants; (2) maintaining liaison with the American Association of Industrial Dentists and the Health and Safety Committee of the National Association of Manufacturers; (3) developing guides for dental societies to use in working with industries; (4) reviewing the Association's recommendations on industrial dental health programs and recommending appropriate changes; (5) making recommendations regarding provisions in dental practice acts relating to industrial dentistry, and (6) encouraging dental societies to work with official health agencies and industrial organizations in their respective areas to improve

the dental health of the working population.

ROLE OF DENTISTRY IN CHRONIC ILLNESS

A statement entitled "The Role of Dentistry in Chronic Illness" was adopted. It will be published in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION and forwarded to the Commission on Chronic Illness for use in connection with the work of the Commission.

The statement emphasizes three aspects of chronic illness that involve dentistry: (1) dentistry has an important role in the detection, control or correction of numerous chronic diseases and impairments; (2) persons with chronic illness require dental care, and (3) many dental conditions may become chronic and, in turn, be a factor in disease.

The Council sent to the House of Delegates a resolution that "constituent and component dental societies be urged to provide the necessary leadership in helping states and communities to develop plans for the dental care and rehabilitation of persons who are chronically ill, and that particular attention be given to methods of providing care in institutions and in the homes of nonambulatory patients."

PROPOSED TREATMENT STUDIES OF THE U. S. PUBLIC HEALTH SERVICE

The Council adopted a resolution that constituent societies be advised to proceed with caution in the development of federally supported dental health programs in any state when the details of such programs have not been communicated to appropriate A.D.A. officials.

The Council has prepared a statement, "Comments of the Council on Dental Health Regarding the U. S. Public Health Service Dental Treatment Studies Proposed for Fluoride Areas," and will make it available to dental societies concerned on request.

APPROVAL OF DENTAL HEALTH EDUCATION MATERIALS

The Council adopted a resolution concerning the method of approval of dental health education materials, and sent to the Board of Trustees and House of Delegates three pertinent resolutions.

The first resolution requests approval of the revised statement, "Policy Governing Approval of Dental Health Education Materials."

The second resolution requests funds for the purpose of designing and duplicating a Seal of Approval for use on materials approved by the Council, and for production and distribution of a leaflet describing the Association's policy regarding the approval of dental health education materials.

The third resolution requests approval of the policy "that permission to reproduce photographs, drawings and other illustrations that are the property of the American Dental Association be granted after the text with which the materials are to be used has been reviewed by an appropriate agency of the Association and found to be consistent with the standards and policies of the Association."

CONFERENCES WITH OTHER HEALTH AGENCIES

The Council adopted a resolution that the 1954 Annual Dental Health Conference "be devoted to an exploration of the ways in which dental societies can promote better dental health programs, with particular emphasis on the financial support and content of the dental programs of dental units in state health departments."

NATIONAL CHILDREN'S DENTAL HEALTH DAY

The Council sent to the Board of Trustees a resolution recommending that the Association's participation in National Chil-

dren's Dental Health Day be continued at approximately the 1954 level during the next several years, that the special materials (except educational pamphlets) supplied to constituent and component societies be prepared and distributed by the Bureau of Public Information with the advice and consultation of the Council and that the Council's regular activities encourage and aid the continuing year-round program emphasized by the one-day observance.

The Council recommended "that constituent and component dental societies be requested to give serious consideration to the possibility of conducting dental health working conferences jointly with community groups as a special feature of the observance of National Children's Dental Health Day" as a method of helping to make the annual observance a year-round activity.

The Council also adopted a resolution to send a questionnaire to constituent and component dental societies to determine their preference on emphasis of a "one-day" or "one-week" celebration.

FLUORIDE MOUTHWASH

The Council adopted a resolution that it call to the attention of dental societies and the public "the fact that there is inadequate evidence to substantiate recommendations for the use of a fluoride mouthwash for the prevention of dental caries." The Council regards the use of a fluoride mouthwash for the prevention of dental caries "except for investigative purposes" as contrary to the public interest. Copies of the resolution will be sent to the appropriate agencies in any state where use of the product is being recommended as a caries-preventive measure.

BUREAU OF LIBRARY AND INDEXING SERVICE

The American Dental Association Film Library

The Association Film Library holds weekly previews of dental health and technical films and considers them for possible showing at the annual session and for possible purchase by the Film Library. Any readers who have recently produced films that depict some phase of diagnosis, treatment or research related to dentistry or to the improvement of dental health are requested to notify the Film Library. Film preview applications will be sent to them, and their films can then be included in the regular film preview schedule.

The film reviewed herein was shown on the motion picture program at the ninety-fourth annual session in Cleveland. Since the number of prints necessarily is limited, it is suggested that program chairmen plan their programs far enough in advance to insure availability.

FILM REVIEWS

Occlusal Equilibration • 16 mm., color, sound, 1,600 ft., 44 min. Produced in 1953 by Nathan Allen Shore, D.D.S. Procurable on loan ($2.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago

11, or on purchase from the producer, 551 Fifth Ave., New York 17.

This film, the purpose of which according to its producer is to teach the theory and practice of equilibrating the occlusion of natural dentition, employs animated drawings, models, charts, roentgenograms and a patient.

The opening half of the film explains causal relationships. Pains in the temporal, aural, cervical and lingual regions are shown to have their origin in the malrelationship of the occlusal surfaces of the teeth. The deleterious effects of force on the teeth and bone and the consequent breakdown of the masticating apparatus are demonstrated on models and diagrams. Discovery and elimination of the cause of the pain are emphasized rather than the treatment of the symptom of pain.

The second half of the film is a detailed study of a case using models and roentgenograms. It concludes by showing the actual grinding of the patient's teeth. Correct centric, lateral and protrusive relationships are exemplified, and the basic principles of equilibration are shown in practice. To assure accurate results a system of checks is set up. The film concludes with a summary.

The use of diagrams, animated drawings, charts, models, roentgenograms and the patient increases the instructional value of the film which is well organized. The photography is good and enables the viewer to observe the technics clearly.

Although the film is not concerned with a study of anatomy, several sequences which show the articulation can be used in a course on anatomy. Dental societies, hospital dental staffs, dental schools and other professional groups may find it interesting program material. This film can be shown in conjunction with the film, "Temporomandibular Joint Disturbances," which was reviewed in THE JOURNAL for August 1953, page 218, and is available from the Film Library. The producer of "Occlusal Equilibration" is the author of the article, "Equilibration of the Occlusion of Natural Dentition," published in THE JOURNAL in April 1952.

COUNCIL ON DENTAL RESEARCH

List of certified dental materials

We have been advised by the manufacturers of the following materials that they wish to withdraw these products from the List of Certified Dental Materials.

CERTIFIED INLAY CASTING GOLD ALLOYS (A.D.A. SPECIFICATION NO. 5)

Alloy		*Manufacturer or distributor*
Bruce "A"	Type A, Soft	Henry F. Bruce Co.
Bruce "0"	Type B, Medium	Henry F. Bruce Co.
Bruce No. 5	Type C, Hard	Henry F. Bruce Co.

CERTIFIED DENTURE RESINS (A.D.A. SPECIFICATION NO. 12)

Material	*Form*	*Manufacturer or distributor*
Premier	Clear; pink; powder-liquid	Premier Dental Products Co.

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

The 1953 survey of dental practice
IV. Sources of dental income; expenses of dentists; auxiliary personnel

Independent dentists participating in this survey were asked to estimate the percentage of their 1952 gross income derived from six specified types of dental services. Income derived from fees for (1) fillings was reported by more dentists than from any other type of service, followed by (2) crowns, bridges and dentures, (3) oral surgery, (4) periodontal treatment, (5) "other," and (6) orthodontic treatment. A total of 91.8 per cent of the dentists reported receiving income for fillings, compared to only 12.6 per cent receiving income for orthodontic work.

At least one statistical discrepancy may be noted in Table 19. The number of dentists reporting 100.0 per cent of their income for orthodontic services was 3.8 per cent of the dentists answering this question, whereas only 3.2 per cent of all dentists returning questionnaires indicated they were orthodontists. The explanation for this inconsistency is that virtually all of the orthodontists answered the question on source of dental income, whereas approximately 1,000 of the general practitioners declined to answer this question.

The percentage of dentists reporting no income from "other dental services" appears too high. The large majority of dentists receive income for roentgenograms and prophylaxes, for instance.

Although the percentages shown in Table 19 do not permit a direct computation of the over-all amounts received for specified types of work by independent dentists in general, they have provided the basis for estimates as shown in Table 20. In arriving at these estimates, mean percentages were first computed, then reduced proportionately so as to add to 100.0 per cent. Small adjustments were then made in the figures to account for the fact that specialists, particularly oral surgeons and orthodontists, earn higher incomes than general practitioners.

Independent dentists were asked to indicate the percentage of their 1951 gross charges remaining uncollected (Table 21). These percentages are believed to represent approximately the amounts uncollectible. Half of the dentists reported uncollected bills at 2.4 per cent of total gross charges or less, and half were above that figure. A similar question was asked in the 1950 Survey of the Dental Profession, when replies indicated that the median percentage of 1948 gross charges uncollected was 2.3 per cent.

Table 22 presents a breakdown of expenses of the average independent dentist. The professional expenses of dentists vary greatly according to number and type of employees, type of practice, location, and so forth. The individual dentist should take this into consideration when comparing his expense breakdown with the list of mean expenses given in Table 22.

It is estimated that in 1952 there were approximately 72,000 dentists in private practice. The averages given in Table 22

The preceding articles on this survey appeared in the December 1953, January and February 1954 issues of The Journal.

Table 19 • Percentage distribution of independent dentists according to percentage of 1952 gross income derived from specified types of dental services

Per cent of gross income	Type of service					
	Fillings (inc. inlays)	Crowns, bridges and dentures	Oral surgery (inc. extractions)	Periodontal treatment	Orthodontic treatment	Other dental services
0	8.2	8.5	16.0	36.2	87.4	48.6
1-9	.9	3.9	26.4	43.3	6.8	29.4
10-19	3.0	13.9	35.4	15.5	1.2	15.8
20-29	8.6	24.8	15.3	3.1	.3	3.5
30-39	13.5	21.0	3.7	.5	.2	.9
40-49	15.6	13.0	.6	.3	.1	.6
50-59	19.7	8.7	.3	.2	.1	.3
60-69	15.1	3.9	.3	.1	.0	.4
70-79	10.1	1.0	.2	.1	.0	.1
80-89	4.1	.8	.1	.0	.0	.0
90-99	1.1	.2	.0	.1	.1	.1
100	.1	.3	1.7	.6	3.8	.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

indicate that in 1952 dentists paid approximately $140,000,000 to commercial dental laboratories and $90,000,000 for dental supplies and drugs. The collective depreciation charges came to about $30,000,000. Depreciation is usually computed at 10 per cent of total expenditures for equipment purchased during the preceding 10 years. Thus it appears that the average total yearly equipment bill of private practitioners for the period 1943-1952 was approximately $30,000,000.

As shown in Table 23, average office rent was highest in the Far West and Southwest and lowest in the Central and Northwest regions. Among the larger states whose average deviated more than $200 from the regional average were Pennsylvania ($807), Florida ($1,328), Iowa ($625), Oregon ($1,098) and Washington ($1,098).

The average salaries and salary ranges of auxiliary personnel are shown in Table 24. Technicians are the highest paid auxiliaries, followed by hygienists. Secretaries and receptionists were paid about the same average salaries as were assistants, although the salary distributions of these two groups differed somewhat.

The monthly salaries of hygienists, technicians and assistants were obtained in the 1950 Survey of the Dental Profession. According to these two surveys, pay increases during the two-year period

Table 20 • Approximate percentage of 1952 gross national income of dentists derived from specified types of dental services (estimated from data in Table 19)

Type of service	Estimated per cent
Fillings (including inlays)	40
Crowns, bridges and dentures	28
Oral surgery (including extractions)	14
Periodontal treatment	6
Orthodontic treatment	5
Other dental services	7
Total	100

Table 21 • Percentage distribution of independent dentists by per cent of 1951 gross charges remaining uncollected in 1953

Per cent uncollected	Per cent of dentists
0	6.7
.00001- .49	6.6
.50- 1.49	19.4
1.50- 2.49	18.3
2.50- 7.49	30.8
7.50-12.49	12.2
12.50-17.49	2.6
17.50-22.49	2.4
22.50 and over	1.0
Total	100.0

Table 22 • Professional expenses of independent dentists, 1952

Item	Mean expenses	Per cent of mean total expenses	Per cent of mean gross income
Office rent	$ 990	12.5	5.3
Utilities	284	3.6	1.5
Depreciation on equipment	417	5.2	2.2
Insurance (liability and equipment)	116	1.5	.6
Travel to professional meetings, society dues, journals, etc.	242	3.0	1.3
Commercial prosthetic laboratory charges	1,908	24.1	10.2
Dental supplies, drugs, etc. (not equipment or office supplies)	1,228	15.5	6.5
Personnel employed	1,963	24.8	10.5
Other expenses (laundry, office supplies, etc.)	776	9.8	4.1
Total	7,924	100.0	42.2

Table 23 • Mean office rent paid by independent dentists in 1952, by region

Region	Mean
New England	$1,000
Middle East	1,026
Southeast	913
Southwest	1,174
Central	837
Northwest	837
Far West	1,321
All regions	990

Table 24 • Percentage distribution of dentists' full-time auxiliary personnel by 1952 salary

Salary	Hygienists	Technicians	Assistants	Secretaries and receptionists
Less than $1,450	3.2	8.8	16.0	23.5
$1,450-$1,949	6.3	11.0	26.3	16.9
$1,950-$2,449	17.1	13.2	31.6	29.8
$2,450-$2,949	21.5	7.7	14.9	12.3
$2,950-$3,449	18.4	13.2	7.0	8.6
$3,450-$3,949	18.4	11.0	2.7	4.3
$3,950-$4,449	5.0	7.7	.7	2.9
$4,450 and up	10.1	27.4	.8	1.7
Total	100.0	100.0	100.0	100.0
Mean salary	$3,065	$3,429	$2,136	$2,185
Median salary	$2,973	$3,225	$2,036	$2,030

amounted to 8.9 per cent for hygienists, 7.2 per cent for technicians, and 19.5 per cent for assistants.

Dentists who employed other dentists full time in 1952 reported paying a mean salary of $7,585, whereas dentists who were employed by dentists as the sole form of dental employment during the year reported receiving a mean salary of $7,215. The latter group undoubtedly included a few dentists who worked less than a full year, particularly 1952 graduates.

Of the independent dentists included

in this survey, 73.1 per cent reported having employees during 1952; 2.8 per cent reported having only part-time employees or employees who worked less than half of the year. In the 1950 Survey of the Dental Profession, 65.6 per cent of the respondents reported employment of at least one full-time dental assistant, technician or hygienist. Secretaries and receptionists were included in the present survey but not in the 1950 survey.

Of all the combinations of number of chairs and number and type of employees listed in Table 25, the largest percentage of dentists reported having two chairs and one assistant (25.1 per cent), followed by one chair and no employees (20.8 per cent) and one chair and one

Table 25 • Percentage distribution of independent dentists by number of chairs and number of employees of specified type in 1952

No. of chairs	No. of employees*					
	Dentists	Hygienists	Technicians	Assistants	Secretaries or receptionists	Per cent
1	0	0	0	0	0	20.8
1	0	0	0	0	Part-time	.5
1	0	0	0	0	1	3.1
1	0	0	0	Part-time	0	1.2
1	0	0	0	1	0	13.9
1	0	0	0	1	1	.4
1	0	0	0	2	0	.3
1	0	0	1	0	0	.3
1	0	0	1	1	0	.2
1		All other dentists with one chair				1.2
2	0	0	0	0	0	5.6
2	0	0	0	0	Part-time	.2
2	0	0	0	0	1	3.4
2	0	0	0	Part-time	0	.6
2	0	0	0	1	0	25.1
2	0	0	0	1	Part-time	.3
2	0	0	0	1	1	1.9
2	0	0	0	2	0	2.3
2	0	0	0	2	1	.2
2	0	0	1	0	0	.4
2	0	0	1	1	0	.7
2	0	0	1	1	1	.3
2	0	Part-time	0	1	0	.4
2	0	1	0	0	0	.8
2	0	1	0	0	1	.2
2	0	1	0	1	0	1.2
2	0	1	0	1	1	.4
2	1	0	0	1	0	.2
2		All other dentists with two chairs				2.5
3	0	0	0	0	0	.3
3	0	0	0	0	1	.4
3	0	0	0	1	0	2.1
3	0	0	0	1	1	1.0
3	0	0	0	2	0	.6
3	0	0	1	1	0	.3
3	0	0	1	1	1	.2
3	0	1	0	1	0	.6
3	0	1	0	1	1	.6
3	0	1	0	2	0	.2
3		All other dentists with three chairs				2.3
		All dentists with four or more chairs				2.8
Total						100.0

*Employees who worked less than a full year, or who worked part time, were counted as fractions. In this table, "part time" means less than .5 employee, "one" means .5 to 1.4 employees and "two" means 1.5 to 2.4 employees.

Table 26 • Percentage of independent dentists employing specified number and type of personnel, by region, 1952

No. and type of personnel*	New England	Middle East	South-east	South-west	Central	North-west	Far West	United States
No employees	20.4	39.4	12.5	11.0	31.9	21.5	15.3	26.9
One assistant	35.1	32.9	48.2	53.2	41.1	49.0	44.9	41.2
One secretary or receptionist	8.9	8.1	4.8	4.5	7.6	6.9	5.2	6.9
One assistant and one secretary or receptionist	1.6	1.7	7.0	8.5	2.8	3.6	4.9	3.5
Two assistants	3.7	2.0	4.5	3.9	3.4	2.0	5.2	3.4
One hygienist and one assistant	5.8	1.7	3.5	.7	1.6	.4	2.8	2.1
One part-time assistant	1.6	1.8	2.0	2.0	1.4	4.5	.9	1.8
One technician and one assistant	.5	1.0	1.0	5.2	.8	1.2	2.0	1.3
Other	22.4	11.4	16.5	11.0	9.4	10.9	18.8	12.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Employees who worked less than a full year, or who worked part time, were counted as fractions. In this table, "part time" means less than .5 employee, "one" means .5 to 1.4 employees and "two" means 1.5 to 2.4 employees.

assistant (13.9 per cent). Many additional combinations were reported; only those reported by at least .2 per cent of the respondents were listed in the table.

Table 26 shows greater regional variations in employment of auxiliary personnel than might be expected. The percentage of dentists employing auxiliary personnel was highest in the Southwest (89.0 per cent) and Southeast (87.5 per cent) and lowest in the Middle East (60.6 per cent) and Central region (68.1 per cent). "One secretary or receptionist," however, was reported by a larger proportion of dentists in the latter two regions than in the former two. "One hygienist and one assistant" was reported most frequently in New England, followed by the Southeast, whereas "one technician and one assistant" was reported most commonly in the Southwest.

The analysis of this survey will be continued in subsequent issues of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

B. Duane Moen, Director

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LON W. MORREY, D.D.S., EDITOR

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THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Editorials

Conference of council officers contributes to Association's public relations program

The Conference of Council Chairmen and Secretaries of the Association held last February 25 and 26 and reported elsewhere in this issue[1] deserves special commendation as it made a distinct contribution to the Association's operations and to the organization's program of public relations.

Designed to advise council officers on the basic policies and current problems of the Association, the agenda included information on the interrelationship of councils and on the relations and obligations of those agencies to the Association, to the constituent societies and, more importantly, to the public. President Leslie M. FitzGerald set the tenor of the meeting in his opening address: "Every council must plan its program primarily in the interest of the health of the public and not in the economic interest of the dental profession." Had he referred to chapter and verse he would have cited Article 11 of the Constitution: "The object of this Association shall be to encourage improvement of the health of the public and to promote the art and science of dentistry"—a public relations attitude that should be deeply embedded in the minds of all members for all time.

The highest praise and gratitude should be given by the membership to the handful of men—approximately 100—who serve gratuitously on the Association's 19 councils. Each of these agencies is doing an admirable job in planning its program and in carrying out the assignments given it by the House of Delegates. To function effi-

ciently, however, the actions of each council must be so geared and so timed that they will mesh harmoniously with the actions of the other councils. For such purpose was the February meeting called, and its outcome was notably successful.

In making the basic policies of the Association and the duties of the councils better known, the Conference contributed to a smoother operating organization and to better relations within the profession. Better understanding of the internal mechanism and workings of the organization leads logically to more fruitful public relations.

Regardless, however, of how well each council functions, how effectively council activities are integrated and how sound the policies of the Association may be, the public's attitude toward dentistry responds to the attitude of dentists. The Association, its few officers, its one hundred or so council members and its fifty-four constituent societies cannot do a public relations job alone. Public relations in the final analysis is the responsibility of each member of the profession. The deeds, actions and attitudes of each add to or detract from the prestige of the profession.

1. News of Dentistry, this issue.

Accident and Health Insurance: still time to enroll in Association's program

Members of the Association who are not sufficiently protected financially against accident and illness are urged to avail themselves of such protection now. The current enrollment period of the Association's accident and health insurance program terminates April 30 after which time twelve months or more may elapse before another enrollment period opens.

Making accident and health insurance available to members is a new venture on the part of the Association—one undertaken at the request of many dentists. Its purpose is to give every member an opportunity to provide himself and his family with some financial protection in the event that he is incapacitated by illness or accident. Even more important, however, is the fact that the program enables physically impaired members, who otherwise could not qualify for such insurance to obtain such protection against similar misfortunes. Physically impaired members can obtain such protection provided fifty per cent of the members of a state dental society or fifty per cent of the members of the Association apply for the benefit. It is hoped that every dentist who is prudent enough to foresee the potential hardships faced by his family should he become incapacitated through illness or accident has made provision for such emergencies.

For those less prudent members—those who think that dentists lead a charmed life—here are a few facts on which to ponder. Dentists are as subject to disease and as liable to accident as other white-collar workers. According to Austin and Kruger of the Mayo Foundation[1] dentists are particularly prone to duodenal ulcers and other diseases involving the gastrointestinal tract. They also seem subject to ophthalmologic disturbances, genitourinary involvements and conditions of exhaustion. Long before

these diseases become killers, they become incapacitators causing loss of time and lowering of income.

G. M. Saunders[2] points out, in the February issue of *Archives of Industrial Hygiene and Occupational Medicine,* that today's high-powered executives are subject to special stresses and strains which require peculiar qualities of resistance to survive. "The ability, vision, imagination and driving energy required by an executive," says Dr. Saunders, "must be coupled with that essential serenity and balance that comes with emotional maturity if executive neurosis is to be avoided." Dr. Saunders' concern for the hard-driving executive might well be directed to the hard-driven dentist. Few vocations are more nerve-racking and more conducive to physical, nervous and emotional strain than dentistry—strains that debilitate although they may not destroy.

According to the Bureau of Economic Research and Statistics of the Association,[3] diseases of the circulatory system topped the list of causes of death of dentists in 1951 and again in 1952. During 1951 almost 58 per cent of the dentists who died succumbed to such disturbances. Neoplasms ranked second with 14.8 per cent and diseases of the nervous system third with 9.4 per cent. In most instances such diseases, long before they strike with finality, incapacitate the operator for a greater or lesser number of days.

It is against these periods of enforced idleness that the dentist must protect himself and those dependent on him. And it is for that purpose that the Association's accident and health insurance plan is offered. Specific details of the program, including benefits and premiums, appear on page A-22 of this issue of THE JOURNAL.

Every member of the Association who is not protected sufficiently against the hazards of accident and illness is urged to take advantage of the Association's accident and health insurance program. Time is of the essence as the current enrollment period closes April 30.

1. Austin, Louie T., and Kruger, Gustav O. Common ailments of dentists: A statistical study. J.A.D.A. 35:797 Dec. 1, 1947.

2. Saunders, George M. Executive health program. Archives of Industrial Hygiene and Occupational Medicine 9:133 Feb. 1954.

3. Causes of deaths of dentists by age groups. Bureau of Economic Research and Statistics, American Dental Association.

Washington News Letter

Dental care benefits for veterans will be re-examined this spring when Congress considers appropriations for Veterans Administration to provide for activities in the fiscal year beginning July 1. The subject continues to be under close study by House and Senate committees.

Recently transmitted to Capitol Hill was the VA's annual report for the year ended June 30, 1953, which discloses a number of interesting facts about the dental program. Following are some of the highlights:

VA REPORT

Applications for outpatient dental treatment totaled 662,000, the largest number since 1950. Almost one third of these were filed by Korean veterans.

At the year's close, there was a backlog of 307,000 applications, almost three times the normal operating backlog.

Approximately 47,000 private practitioners participated in the "home town" dental care program on a fee basis. They conducted 38 per cent of all the examinations and gave treatment in 76 per cent of all the cases requiring dental care.

"The average cost for fee-basis treatment," says the report, "has risen from $70 a case in fiscal year 1947 to $96.72 per case in fiscal year 1953. Had it not been for the large number of Korean veterans applying during fiscal year 1953, the treatment cost would have been even higher since these veterans had prima facie eligibility which permitted only extractions and fillings; no prosthetic restorations were authorized until service connection had been established.

"Factors affecting the rising dental costs are: (1) the aging of the veteran population with the resultant increase in its dental requirements; (2) limited fee funds and other reasons which defer the veterans' required treatment, thereby resulting in the development of more serious dental conditions; and (3) the increased cost of living, resulting in an upward adjustment of the dental fee schedules."

CURRENT LEGISLATION

President Eisenhower's plan for federal reinsurance of health insurance coverage was formally presented to Congress for approval March 11. Soon thereafter the Senate Committee on Labor and Public Welfare announced that its health subcommittee would open public hearings on April 12.

Government reinsurance is regarded as highly controversial, notwithstanding assurances given by the President, Congressional leaders and Mrs. Oveta Culp Hobby, Secretary of Health, Education and Welfare, that it poses no threat of socialized medicine. They emphasize that participation by insurance companies, group-practice partnerships, voluntary prepayment agencies and other eligible organizations would be strictly voluntary and that the enabling bill carries safeguards against federal control.

The bill states, "The secretary [of Health, Education and Welfare] shall not approve for reinsurance any health service prepayment plan which contemplates that medical or dental care or treatment be furnished by the applicant for reinsurance through salaried physicians or dentists in the employ of such applicant unless the Secretary is satisfied that such applicant has an organizational structure which vests control over the manner in which medicine and dentistry are practiced, in connection with the health services concerned, solely in duly licensed

members of the professions involved."

The Senate Armed Services Committee scheduled a public hearing for March 18 on a bill introduced by its chairman, Senator Leverett Saltonstall, to authorize military utilization of "noncommissionable" physicians and dentists as enlisted men.

Enactment of the measure, which would amend the doctor-draft law, has been recommended by the Department of Defense. It is intended to disentangle the military establishment from the complicated situation in which it has become involved as the result of the refusal of some special registrants to take loyalty oaths preliminary to the granting of commissions.

NEW APPOINTMENT

Dr. Albert H. Holland, Jr., has taken office as medical director of the Food and Drug Administration, filling a position that had been vacant since July 1952. The division which Dr. Holland heads examines drug products for propriety of labeling and freedom from adulteration. One of its responsibilities is administration of the new-drug provisions of the Food and Drug Law, which require scientific testing to establish safety of drugs and proprietary products before they are placed on the market.

Dr. Holland joined FDA from Armour Laboratories in Chicago, where he had been medical director since January 1951. Previously he was director of the office of research and medicine at Oak Ridge, Tenn., laboratories of the Atomic Energy Commission.

Upon recommendation of President Eisenhower, the Civil Service Commission has begun detailed study of plans whereby employees of the federal government would be eligible to apply for health insurance coverage, a portion of the premium payments to be made by the government.

Details of the plan are being worked out. No decision has been reached as to whether benefits would include dental as well as medical care. Proposed coverage would be in the nature of "fringe benefits," supplementing the employee's salary, comparable to those which have gained wide adoption in industry under the impetus of collective bargaining.

MEMBERSHIP AT ALL-TIME HIGH, BOARD OF TRUSTEES HEARS; APPROVES PLANS AND PERSONNEL FOR ANNUAL SESSION

Membership in the Association as of December 31, 1953 stood at 80,127, the highest in history, it was reported to the Board of Trustees at its meeting in the Central Office March 18-20. "This membership is evidence," said Secretary Harold Hillenbrand, "that the dental society offers services of value to its members."

Among the topics of major interest considered by the Board were plans for the annual session in Miami, federal legislation affecting the profession of dentistry, a proposed study of the increased activity of mail order denture firms and increased participation by the Association in international dental events.

INTERNATIONAL AFFAIRS

Association Secretary Harold Hillenbrand urged increased financial support to the Fédération Dentaire Internationale. He pointed out that the A.D.A. probably has a large stake in developing a strong international organization in dentistry because of the influence the F.D.I. can have on such problems as relations with the World Health Organization, programs for dental nurses and dental technicians and "socialized programs" of dental care.

ASSOCIATION CENTENNIAL

A committee of Central Office staff will prepare a preliminary outline of a centennial celebration for presentation to the Board of Trustees at its next session, it was decided. The appointment of a Special Committee on Centennial Program will be deferred until the site of the 1959 annual session is determined by the House of Delegates. The Board also decided to ask the House of Delegates to take final action in Miami on selecting sites for the 1957 and 1958 annual sessions.

ANNUAL SESSION

The following nominations by the Council on Scientific Session to fill vacancies on the 1954 list of section officers were approved by the Trustees: Operative Dentistry, Arnie F. Romnes of Illinois as vice-chairman; Public Health Dentistry, George B. Clendenin of Maryland as vice-chairman; Oral Surgery and Anesthesia, Jack B. Caldwell of the Army as chairman.

Local Arrangements Committee • On the recommendation of the General Committee on Local Arrangements, of which Curtis A. Haggard is chairman, the Board approved the following nominations for officers and committee members for the 95th annual session of the Association to be held in Miami, Fla., November 8-11:

Honorary Officers • Robert Thoburn, Thomas A. Price, Albert E. Rosenthal, Leonard S. Turner, James L. Armstrong.

Vice-chairmen • Ernest B. Penn, E. Roger Turner, James E. Edwards, Horace L. Cartee.

Committee on Social and Entertainment Events • Charles L. Craig, chairman, J. A. DuPree, vice-chairman, Jack H. Beckwith, Leonard H. Finn, William F. Graves, Charles A. Forum, Edward H. Arnold, Leslie H. Bell, Winton Churchill, W. R. Edwards.

Committee on Information Services • George J. Coleman, chairman, John Pickett Miles, vice-chairman, Fred W. Crockett, George Keffer, Robert Litowitz, William M. Schiff, Kenneth C. Wittich, William F. Briggle, D. Frank Rentz.

Committee on Reception • S. Hill Gordon, chairman, Joseph T. Cox, vice-chairman, Carl P. Arant, H. H. Burkart, Henry J. Biosca, Robert L. Cherry, J. R. Clawson, Blair Madsen, A. W. Kellner.

Committee on Clinics and Motion Pictures • H. Willett Stubbs, chairman, Frank M. Kenward, vice-chairman, J. W. Fuller, H. I. Kendrick, Olin McKenzie, Richard Mathewson, Murray Cox, A. R. Joffre, Gilbert DeArmes, Leslie Bell.

Committee on Women's Entertainment • Mrs. Curtis Haggard, chairman, Mrs. H. Willett Stubbs, vice-chairman, Mrs. Charles Craig, Mrs. William Briggle, Mrs. Olin McKenzie, Mrs. Richard Mathewson, Mrs. Roy Ellsworth, Mrs. Norman Alley, Mrs. Henry Renedo, Mrs. Clyde Kesinger.

Committee on Publicity • Raymond J. Smith, chairman, E. C. Wilson, vice-chairman, Jack Seithlin, Glen O. Skaggs, R. L. Kaplan, Joe Sansone, B. E. Smyers, H. L. Anderson and Norman Alley.

ANNUAL SESSION FOR 1956

Eugene R. Westcott of Atlantic City was appointed by the Board to serve as chairman of the General Committee on Local Arrangements for the 97th annual session of the Association to be held in Atlantic City October 1-4, 1956.

FEDERAL LEGISLATION

The dental implications of bills designed to implement the President's health program are vague, the Board reported. These bills are now under study by the Councils on Legislation and on Federal Dental Services. Association views on such matters as the health program, Department of Defense scholarship bill, dependent care for military personnel and inclusion of dentists in OASI will be presented before Congressional committees during the next few months, it was announced.

TRADE AND LABORATORY RELATIONS

The Board approved a recommendation of the Council on Dental Trade and Laboratory Relations that the Association study the increasing activities of mail order denture firms, particularly as those activities relate to the federal mail order denture law.

AUDIT REPORT

The Board concurred in a recommendation of the Committee on Finance and Investment that the audit report of the Association should be published annually and authorized the Secretary to publish the report each year as a supplement to the *Transactions*.

The Committee set aside $200,000 for the Headquarters Fund as of March 19, 1954. The Association now has $500,000 earmarked for Headquarters building purposes.

DENTAL RESEARCH

The Council on Dental Research presented a recommendation, which the Board approved, that Specification No. 6 for dental mercury be amended to require that mercury be packed in clear glass containers or in containers made of polyethylene.

The Council also reported on the paucity of funds available for dental research and on the uneven distribution of research studies being conducted throughout the country.

Relations with Trade • Better understanding of each other's problems is being engendered by meetings between representatives of the American Dental Trade Association and the Council on Research, it was reported. At the latest meeting held in November 1953 a number of recommendations were agreed on by the two groups. Among the steps proposed were: frequent retesting of dental materials, periodic visits by members of the Fellowship to factories producing dental materials and the speeding up of the certification program so that new mate-

rials can be covered more rapidly. The American Dental Trade Association Liaison Committee agreed to watch over its own membership in respect to misleading statements in advertising. It also agreed to cooperate in every way possible with the Joint Specifications Committee of the Dental Materials Group of the International Association for Dental Research.

Dental Therapeutics • The Council on Dental Therapeutics presented a request, which the Board approved, that the Argentine Dental Association be permitted to prepare a translation and to publish one edition in Spanish of *Accepted Dental Remedies,* provided that control of the Spanish edition remain in this Association.

Acceptance of Products • The Board also approved for transmission to the House of Delegates a recommendation of the Council to amend the *Provisions of Acceptance of Products* listed in Group B. The section previously read:

Group B consists of products which lack sufficient evidence to justify present acceptance, but for which there is reasonable evidence of usefulness and of safety. These products meet the other qualifications and standards established by the Council on Dental Therapeutics. It is the Council's opinion that Group B products may be promoted for special use and study.

The Board added to this the following paragraph:

The Council's initial consideration of products which may be eligible for Group B listing is influenced favorably by the knowledge of further investigations then in progress. It is the policy of the Council to reconsider Group B products each year on the basis of new evidence which may be produced in their support. Classification in this category is not ordinarily continued for more than three years.

Anti-Enzyme Dentifrices • The Council reported that, after reviewing all the available evidence concerning anti-enzyme dentifrices, it believed that claims for the effectiveness of anti-enzyme dentifrices are not yet substantiated. (See March issue of THE JOURNAL, page 341.)

MEMBERSHIP

Eight applications for affiliate membership were approved. The new affiliate members are: George Donald Bissell, Jr., of the West Indies, Roberto Chartier of Costa Rica, Jules Forcier Desilets of Canada, Leonard James of Argentina, Ricardo B. Jamora of the Philippines, V. M. Khosla of Scotland, Juvenal Llanos of Peru and Alonzo L. Seidler of Arabia.

SECTION OFFICERS FOR 1955

Approved as section officers for 1955 were:

Operative Dentistry: Arne F. Romnes of Illinois, chairman; William J. Simon of Iowa, vice-chairman.

Oral Surgery and Anesthesia: Samuel A. Brandon of Oregon, chairman; J. Lorenz Jones of Southern California, vice-chairman.

Orthodontics and Oral Development: William S. Brandhorst of Missouri, chairman; George A. Denham of Minnesota, vice-chairman.

Pedodontics: Maury Massler of Illinois, chairman; John M. Clayton of Missouri, vice-chairman.

Periodontics: James P. Hollers of Texas, chairman; Donald A. Kerr of Michigan, vice-chairman.

Practice Administration: Hollis A. Askey of Nebraska, chairman; Ivor P. Muzzy of Massachusetts, vice-chairman.

Complete Prosthodontics: Hugh T. McKinnon of Alabama, chairman; Arthur L. Roberts of Illinois, vice-chairman.

Partial Prosthodontics: Otto W. Silberhorn of Illinois, chairman; Richard L. Simpson of Virginia, vice-chairman.

Public Health Dentistry: George B. Clendenin of Maryland, chairman; Polly Ayers of Alabama, vice-chairman.

Research: David F. Mitchell of Minnesota, chairman; Rediar F. Sognnaes of Massachusetts, vice-chairman.

Roentgenology: William E. Koch, Jr., of Missouri, chairman; Gordon M. Fitzgerald of California, vice-chairman.

SPEAKERS' PROGRAM

Revision of the Trustees' and State Speakers' Program was agreed on by the Board in order to provide additional services to constituent societies. The new basis of the program is as follows:

1. The President of the Association may, as at present, visit constituent societies at his own option and without limitation of such travel.

2. Each member of the Board of Trustees may visit his constituent societies at the expense of the Association.

3. The State Speakers' Program is established in its former status with the limitation that speakers can be invited only to annual sessions of the constituent society or, as an alternative, to the largest meeting of members which is held by a constituent society.

SURVEY OF DENTISTRY

The Board of Trustees approved an agreement reached between the American Council on Education and the Special Committee on Survey of Dentistry consisting of Otto W. Brandhorst, chairman, Willard Fleming and H. B. Washburn, whereby the American Council on Education would sponsor the *Survey of Dentistry* with the cooperation of the American Dental Association. The Board also appointed four additional members to the original three man committee: Percy T. Phillips, Paul H. Jeserich, Fritz A. Pierson and William N. Hodgkin.

ADDITIONAL ACTIONS

Code of Ethics of Component Societies • The Board of Trustees advised dental societies against changes in the *Principles of Ethics* intended to root out subversive persons. Said the Board, "The determination of any citizen's conduct or personal association that might . . . constitute a disloyalty to this country . . . must, in the Association's opinion, be left to the responsible agencies of our government."

Recognition Certificates • Recognition Certificates are to be awarded to all members who have served on the Association's councils since 1948, it was decided, and certificates shall be presented annually to all members of councils who have completed their term of service on a council.

BOARD MEMBERS PRESENT

All officers and members of the Board of Trustees attended the meeting. Officers present were: Leslie M. FitzGerald of Dubuque, Iowa, president; Daniel F. Lynch of Washington, D. C., president-elect; Walter J. Pryor of Cleveland, first vice-president; Charles A. Pankow of Buffalo, second vice-president; Hollis O. Warrick of Enid, Okla., third vice-president; Harry Lyons of Richmond, Va., speaker of the House of Delegates; Harold Hillenbrand of Chicago, secretary; C. Willard Camalier of Washington, D. C., assistant secretary; Louis M. Cruttenden of Chicago, assistant secretary; H. B. Washburn of St. Paul, treasurer, and Lon W. Morrey of Chicago, editor.

Trustees attending were: William R. Alstadt of Little Rock, Ark., twelfth district; Charles H. Patton of Philadelphia, third district; Howard B. Higgins of Spartanburg, S. C., fifth district; L. H. Jacob of Peoria, Ill., eighth district; Paul H. Jeserich of Ann Arbor, Mich., ninth district; Earl G. Jones of Columbus, Ohio, seventh district; Bernerd C. Kingsbury of San Francisco, thirteenth district; Percy T. Phillips of New York, second district; Clarence S. Renouard of Butte, Mont., eleventh district; A. F. Schopper of Kansas City, Mo., sixth district; Charles I. Taggart of Burlington, Vt., first district; Lewis W. Thom of Minneapolis, tenth district, and Edward R. White of Jersey City, fourth district.

DISCUSS DENTIST WAR ROLE WITH HOOVER COMMITTEE

Bernard J. Conway, secretary of the Association's Council on Federal Dental Services, appeared before a subcommittee of the Hoover Commission's Medical Task Force at its invitation March 11 to discuss dentistry's responsibility in time of total war. Lloyd Rogers, president of Detroit Receiving Hospital and a member of the Association's Subcommittee on Civil Defense, was to have testified but was unable to attend.

Mr. Conway described for the committee the A.D.A.'s program and submitted the Detroit Society's plan as an example of local dental efforts.

According to the Federal Civil Defense Administration, said Mr. Conway, plans must be made on the basis of 75,000 to 100,000 casualties for each well placed atomic bomb on a large metropolitan area. As there will be insufficient medical personnel to give the required care, the A.D.A. is attempting to see which emergency medical services may best be performed by the dentist and is developing training programs to prepare the dentist to perform these services.

The A.D.A. believes, he pointed out, that best results can be achieved by having the government's over-all plan based on existing organizations of health personnel, and by having the dentist integrated into the medical team at the local level.

The Association is working closely with its constituent societies and has urged that dentists be appointed to state and regional civil defense service committees.

First-aid training and advanced instruction in emergency casualty care are musts in the training program, he said. Dental schools are also being urged to enroll students in such programs.

Under the Detroit plan pioneered by Dr. Rogers, an evening course of seven weeks was developed. Over 400 dentists have received training.

DIGEST OF OFFICIAL ACTIONS PREPARED BY BUREAU

The *Digest of Official Actions,* covering the period from 1946 to 1953, has been completed by the Bureau of Library and Indexing Service, and will be published during April. The book indexes the actions of the House of Delegates and the Board of Trustees.

EFFECTIVE PROGRAM IS GOAL OF COUNCIL CONFERENCE

"If the Association can meet the challenges of a changing society by an alert program, it will be only because the councils have planned carefully, worked hard, deliberated long and spoken thoughtfully." In these words Harold Hillenbrand, Association secretary, expressed the idea which lay behind the calling of the first Conference of Council Chairmen and Secretaries, which was held February 25 and 26 at the Central Office.

Designed to point up the ways to effective functioning of the Association councils, the program covered such topics as the objectives of the Association, relation of councils to the public, to each other, to the Association and to the constituent societies. Methods of planning and carrying out effective council programs were discussed. The problem of choosing able council personnel was also considered.

Association president Leslie M. FitzGerald pointed out that the Association's main responsibility as a professional, not-for-profit organization is to the public. "Every council," he said "must plan its program primarily in the interests of the health of the public and not in the economic self-interest of the dental profession." The programs recommended by the Association's councils, speakers said, can be carried out in the main only through cooperation with the constituent societies. The job of councils is to develop programs which will advance the

objectives of the Association and which will fit the needs of the various societies.

In addition to Dr. FitzGerald and Dr. Hillenbrand, the conferees heard Louis M. Cruttenden, assistant secretary; Herbert B. Bain, director of the Bureau of Public Information; Francis J. Garvey, secretary of the Council on Legislation, and John J. Hollister, business manager.

W. H. CAMPBELL NAMED TO PLAN PROJECTED CLINICS PROGRAM

Walter H. Campbell of Miami Beach, Fla., has been named head of the committee to plan the projected clinics for the Association's annual session, announced Charles S. Kurz, chairman of the Council on Scientific Session.

The projected clinics, in which the demonstrator will use visual aids such as slides to help in his presentation, are an innovation for the scientific program. Dr. Campbell's committee will endeavor to plan a program of interest to dentists in general practice.

DEADLINE SET FOR EXHIBITS AT THE MIAMI SESSION

Applications are available for space in the scientific exhibit of the 1954 annual session, the Council on Scientific Session has announced. Applications should be submitted before June 15 if the exhibit is to be listed in the preliminary program to be published in THE JOURNAL. Motion pictures also should be submitted for previewing before that date.

All members of the Association are

Miami will be the scene of the Association's 95th annual session November 8-11. Hotel accommodations must be reserved through the Association's Housing Bureau, it has been announced. The Bureau, which opens April 1 at 320 N.E. Fifth Street in Miami, will accept only those applications which are made on the official Association form or on the coupon to be found on page A-31 of THE JOURNAL.

Participating in the first Conference of Council Chairmen and Secretaries were (standing, l. to r.): Max E. Ernst, Gerard J. Casey, Shailer A. Peterson, C. Willard Camalier, Karl S. Richardson, W. Philip Phair, Lon W. Morrey, M. C. Hansen, Louis M. Cruttenden, Leo W. Kramer, Herbert B. Bain and Charles S. Kurz. Seated (l. to r.) are Boleslaw M. Tylicki, John R. Wallace, Frank B. Hower, Daniel F. Lynch, Henry A. Swanson, David W. Brock and Frank O. Alford.

eligible and are urged to take part in the exhibit and motion picture program, Donald Washburn, director of the Scientific Exhibit, stated. Applications may be obtained by writing to the director, Scientific Exhibit, at the Central Office, and should be filed before August 1.

A.D.A. OFFICIALS REVIEW GOVERNMENT HEALTH PLANS

The federal government's proposed health program, operation of the dentist-physician draft law, dental care of military dependents, the Veterans Administration dental program and proposed extensions of the Social Security program were among subjects considered at a joint conference of the Association's Councils on Legislation and on Federal Dental Services with federal officials in Washington March 26-28.

Implications for the dental profession of legislation already introduced to implement the President's health program were discussed. Now in the Congressional hopper are H.R. 8356 and its companion measure S. 3114, which provide for reinsurance of voluntary prepaid health insurance plans; H.R. 8149, which extends the Hill-Burton Act to provide grants-in-aid for diagnostic and treatment centers, nursing homes and hospitals for the chronically ill; and H.R. 7397, which simplifies the system of grants-in-aid to the states.

Participating in the meeting were Maj. Gen. Walter D. Love, chief of the Army Dental Corps; Rear Admiral Daniel W. Ryan, chief of the Navy Dental Corps; Brig. Gen. Marvin E. Kennebeck, chief of the Air Force Dental Service; John W. Knutson, chief of the Dental Division, USPHS; John Fauber, assistant chief medical director for dentistry of the VA; Frank W. Berry, Assistant Secretary of Defense for Health and Medicine; Russell R. Larmon, Assistant Secretary of the Department of Health, Education, and Welfare; Col. Richard H. Eanes,

Conferees at the Council Chairmen and Secretaries' meeting were (standing l. to r.) Walter E. Dundon, Francis J. Garvey, John J. Hollister, W. L. Barnum, C. E. Peterson, H. Trendley Dean, John R. Abel, R. H. Friedrich, Edward G. Hampp, George C. Paffenbarger, Bernard J. Conway and J. Roy Doty. Seated (l. to r.) Frederick W. Herbine, Thomas J. Hill, Harold Hillenbrand, Leslie M. FitzGerald, Otto W. Brandhorst, Oren A. Oliver and M. K. Hine.

chief medical officer of the Selective Service System, and Otto W. Brandhorst, dentist member of the Hoover Commission Task Force on Medical Care.

As part of the conference the Association Subcommittee on Civil Defense, headed by John R. Abel of Los Angeles, conferred with officials of the Federal Civil Defense Administration. Presiding at the joint session of the two Association Councils were E. Harold Gale and Rudolph H. Friedrich, the Council chairmen.

A TOTAL OF 3,622 APPLY FOR ASSOCIATION INSURANCE

A total of 3,622 applications for coverage in the Association's Health and Accident Insurance program were received as of March 12, it has been announced by C. E. Peterson, chairman of the Council on Insurance. This number represents a little over one third of the national quota, which, if reached, would permit coverage of all Association members including those with unfavorable medical histories, the so-called impaired risks.

Quotas also have been set for each state so that if the national quota is not reached, impaired risks of the qualifying state may still be covered. Constituent societies which have already qualified are Arizona, Idaho, New Mexico, South Carolina and Hawaii. Societies which need less than 50 additional applications include: Delaware, Montana, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, Virginia, Wyoming and Puerto Rico.

April 30 is the deadline date for applications. Dentists up to 70 years of age are eligible to apply.

Appealing to state society officers to urge their members to seek coverage, Dr. Zillmann, insurance trustee, pointed out that the insurance is being offered through the Association at a cost of from 35 to 50 per cent below the cost of similar protection purchased on an individual basis.

Among the conferees at the Workshop on Dental Specialties are seated (l. to r.): R. H. Sullens, J. Roy Blayney, Arthur W. Easton, Philip E. Blackerby, William R. Mann, Shailer Peterson. Standing (l. to r.) are: Capt. A. H. Grunewald, Frank J. Houghton, John E. Buhler, Harold J. Leonard, Gustav O. Kruger, Eugene Westcott, Cletus Cummiskey and Harold Hillenbrand.

COUNCIL ACCREDITATION OF SPECIALTY TRAINING FAVORED

A total of 65 persons representing each of the specialty boards, the dental schools, the hospitals and the state boards of dental examiners attended the Workshop on Dental Specialties held March 10-12 at the Central Office.

The Workshop was sponsored by the Council on Dental Education for the purpose of finding solutions to problems confronting the specialty boards and those planning hospital and dental school specialty education programs.

Major conclusions reached by the group were: (1) all advanced educational programs for the dental specialties should be evaluated and accredited by the Council on Dental Education, (2) a uniform or similar system of record keeping should be used by the various boards and (3) an aptitude test might be given to prospective graduate students to assist the boards in counseling potential candidates.

Approval was given to a transcript record form to be used by specialty board candidates in reporting their past educational experience and their plans for future training. The group also plans to hold a meeting in the next six months.

Philip E. Blackerby, Jr., chairman of the Council's Committee on Dental Specialties, presided at the meeting.

Serving as resource leaders and discussion moderators were: Allan G. Brodie, O. M. Dresen, Ralph L. Ireland, William R. Mann, Gustav O. Kruger, Harold J. Leonard, C. Edward Martinek, Maynard K. Hine, J. Roy Blayney, Henry M. Goldman, John E. Buhler and Frank J. Houghton.

TO STUDY VARIOUS PLANS OF LABORATORY ACCREDITATION

Acting under a directive of the House of Delegates, the Council on Dental Trade and Laboratory Relations will conduct a review of the various plans used by constituent societies in the accreditation of dental laboratories, the Council has announced.

With the study as a base, the Council will consider whether it is desirable to recommend any modifications of the Association's principles and guides for constituent society dental laboratory accreditation programs.

The Council considered also the advisability of investigating the activities of mail order denture firms. These firms have been increasing their advertising to the public in a number of national publications.

Included in the actions taken by the Council at its February 28-March 1 meeting was a decision to investigate in

consultation with the Council on Dental Education the desirability of establishing short refresher courses to be conducted by the dental schools for dental laboratory technicians. The Council also outlined material for two bulletins to be distributed to constituent societies. The bulletins will explain Council programs as they affect the societies.

RELIEF FUND GOAL REACHED IN RECORD TIME

The relief fund quota was filled in record time, it has been reported. On March 4, the $100,000 goal was achieved, and by March 15 the fund was over the top with a total of $101,238.15 received. The $100,000 mark was reached about two weeks ahead of the date of last year.

As of March 15 a total of 29 societies had filled or overfilled their quota. $714.25 had been contributed by students, dentists in unorganized regions and associated members. Contributions of constituent societies were as follows:

Quota Over $900.00

	Quota	Contributions to March 15	Pct.
California	$ 3,740.00	$ 4,406.50	117.8
So. Calif.	4,530.00	7,462.00	164.7
Colorado	920.00	1,013.00	110.1
Connecticut	1,930.00	1,813.12	93.9
Florida	1,270.00	1,430.00	112.6
Georgia	1,040.00	970.50	93.3
Illinois	7,370.00	7,457.25	101.2
Indiana	2,350.00	2,553.00	108.6
Iowa	1,860.00	2,206.80	118.6
Kansas	990.00	910.30	91.9
Kentucky	1,120.00	1,384.80	123.6
Louisiana	1,010.00	1,106.50	109.6
Maryland	1,060.00	1,057.00	99.7
Massachusetts	3,780.00	3,582.81	94.8
Michigan	4,010.00	4,412.65	110.0
Minnesota	2,940.00	2,801.50	95.3
Missouri	2,530.00	2,385.56	94.3
Nebraska	1,060.00	1,079.85	101.9
New Jersey	4,070.00	4,338.50	106.6
New York	15,210.00	11,172.86	73.5
N. Carolina	1,230.00	1,122.50	91.3
Ohio	4,980.00	4,554.05	91.4
Oregon	1,200.00	1,187.00	98.9
Pennsylvania	6,830.00	5,386.50	78.9
Tennessee	1,200.00	3,320.53	276.7
Texas	3,160.00	2,232.50	70.6
Virginia	1,130.00	1,127.00	99.7
Washington	1,780.00	2,116.50	118.9
Wisconsin	2,910.00	2,208.00	75.9
Total	$87,210.00	$86,799.08	99.5

Quota of $900.00 or Less

	Quota	Contributions to March 15	Pct.
Air Force	$ 600.00	$ 496.90	82.8
Alabama	750.00	1,742.11	232.3
Alaska	50.00	224.50	449.0
Arizona	280.00	101.00	36.1
Arkansas	560.00	643.00	114.8
Army	630.00	357.50	56.7
Delaware	160.00	173.00	108.0
Dist. of Col.	850.00	1,414.00	166.4
Hawaii	360.00	472.00	131.1
Idaho	260.00	594.00	228.5
Maine	450.00	313.00	69.6
Mississippi	520.00	477.96	91.9
Montana	370.00	421.15	113.8
Navy	830.00	425.50	51.3
Nevada	90.00	120.50	133.9
New. Hamp.	290.00	261.00	90.0
New Mexico	250.00	286.50	114.6
N. Dakota	340.00	493.05	145.0
Oklahoma	890.00	1,218.00	136.9
Panama, C. Z.	20.00	20.00	100.0
P. H. Service	260.00	141.50	54.4
Puerto Rico	190.00	175.00	92.1
Rhode Island	580.00	414.50	71.5
S. Carolina	410.00	345.00	84.1
S. Dakota	340.00	570.00	167.6
Utah	450.00	382.50	85.0
Vermont	190.00	144.00	75.8
Vet. Admin.	900.00	362.15	40.2
W. Virginia	740.00	775.50	104.8
Wyoming	180.00	160.00	88.9
Total	$12,790.00	$13,724.82	107.3

ANNOUNCE ADDITIONAL ACCREDITED PROGRAMS

The Council on Dental Education has announced approval of dental internship or residency programs in 14 additional U. S. hospitals. Graduate training programs for dentists have now been approved in 131 hospitals throughout the nation.

The newly approved programs are in the following hospitals: Letterman Army

Hospital, San Francisco; Jackson Memorial Hospital, Miami, Fla.; Veterans Administration Hospital, Atlanta, Ga.; Veterans Administration Hospital, Iowa City; Mercy Hospital, Inc., Baltimore; National Naval Medical Center, Bethesda, Md.; Kings County Hospital and Cumberland Hospital, Brooklyn; Mount Sinai Hospital, New York City; Sea View Hospital, Staten Island, N. Y.; Veterans Administration Hospital, Aspinwall, Pa.; Children's Hospital, Hospital of the University of Pennsylvania and St. Christopher's Hospital for Children, Philadelphia; Veterans Administration Hospital, Birmingham, Ala.; Los Angeles County General Hospital, Los Angeles, and Veterans Administration Hospital, Houston, Texas.

CRITICISM OF FLUORIDATION ANSWERED IN BOOKLET

Fluoridation Facts—Answers to criticisms of fluoridation, a 21 page booklet recently revised by the Council on Dental Health, answers with facts the false statements made by opponents of fluoridation.

Each antifluoridation assertion is followed by the fact which answers it. Subjects range from whether fluorides cause cancer and hardening of the arteries to whether fluoridation is socialized medicine.

Single copies of the pamphlet may be had by writing to the Council on Dental Health at the Central Office.

JUNE MEETING TO ANALYZE DENTAL PUBLICATIONS

State dental publications will be analyzed from the standpoint of content and format during the Council on Journalism conference June 18 and 19 at the Association's Central Office.

Specialists in layout, design and editing will discuss these various aspects of the journalism field with the conferees. How to select a journal printer and how to choose types and qualities of paper suitable for the dental journal also will be considered.

Details of setting up a central advertising bureau to act as the agent for the societies in acquiring national accounts will be studied at the conference. The Council on Journalism has arranged a tour through a modern printing plant for those attending the meeting.

WILL TELL PLAN TO INCREASE NUMBER OF DENTISTS

Harold Hillenbrand, secretary of the American Dental Association, will be a featured speaker at the 43rd annual meeting of the American Dental Trade Association in New Jersey April 27. He will discuss Association plans to increase the number of dentists to supply the larger demands for dental service resulting from a rapidly expanding population and an increased appreciation of dental care.

Dental educators scheduled to take part in a panel discussion are Gerald D. Timmons, dean of Temple University School of Dentistry; Maynard K. Hine, dean of Indiana Dental College; Wendell D. Postle, dean of Ohio State University College of Dentistry, and J. Ben Robinson, dean of West Virginia University School of Dentistry.

FAILURE RATE OF FRESHMEN FALLS TO TWO PER CENT

The percentage of freshman dental students who fail scholastically is only about one fifth as high today as the rate ten years ago, it was announced March 12 by Shailer Peterson, secretary of the A.D.A. Council on Dental Education. The national average last year was "an almost irreducible" 2 per cent.

The drastic reduction in the scholastic mortality rate is largely a result of the Association's aptitude testing program,

Dr. Peterson said. Last year, the programs tested 5,500 applicants for the approximately 3,200 openings for freshman students. During that year 20 schools reported no failures, as compared to 1943, when the rate of failures in some schools reached 50 per cent.

A total of 17,000 applicants have been tested during the three years the program has been in full operation. All 43 of the nation's dental schools participate in the program.

Leslie M. FitzGerald (right), Association president, presents a silver tray to George C. Paffenberger, in honor of his 25 years of service with the Association. Dr. Paffenberger is director of the Fellowship Division at the National Bureau of Standards. He is author of 40 published reports on dental materials and coauthor of the book "Physical Properties of Dental Materials." Dr. Paffenberger is president-elect of the International Association for Dental Research. Watching the presentation which took place at the Central Office February 26 is president-elect Daniel F. Lynch.

NATIONAL BOARD EXAMINES 3,300

A total of 3,300 students and graduates from all of the nation's dental schools participated in the National Board examinations held March 29 and 30. Members of the Armed Services also participated. In all, 1,562 persons took part I of the examination; 1,738 took part II.

This is the largest group ever to participate in a National Board examination, said Frank O. Alford, chairman of the Council of the National Board of Dental Examiners. There were 412 more persons taking the examination this year than there were in April of last year, when 2,888 participated. The next sessions will be held December 6 and 7.

National Board certificates and grades are accepted as partial fulfillment of requirements for the practice of dentistry by 28 states, by Puerto Rico, by the Public Health Service, by the U.S. Army and by the U.S. Navy.

COUNCIL APPROVES DENTAL HYGIENE PROGRAMS

The Council on Dental Education has announced that the University of Alabama Department of Dental Hygiene has been approved and that the curriculum in dental hygiene of the University of Louisville School of Dentistry has been provisionally approved.

The program at Louisville is under the direction of William R. Wolfe, Jr. Marjorie Houston directs the Alabama program. There are now 24 accredited dental hygiene programs.

ASSOCIATION MEMBERSHIP EXPLAINED IN PAMPHLET

A revised edition of the pamphlet *Membership in the American Dental Association . . . its benefits and meaning* is available from the Central Office free of charge to interested dental societies.

The pamphlet answers such questions as, How does a dentist become a member of the Association? May he be a member of the Association without being a member of a constituent society? and What are the classifications of membership? It describes also the purposes and major functions of the Association and the services it offers to its membership.

BOOKLET PUBLISHED ON SCHOOL DENTAL PROGRAMS

Dental Health Programs in the Schools is the title of a new booklet published by the Division of Dental Health Education of the Council on Dental Health.

The booklet outlines the components of a good dental health program in the schools. It has been designed for use by school health directors, school administrators, dental advisers and dental societies. Single copies are available from the Division of Dental Health Education at the Central Office.

Dental Societies

JAIL SENTENCE IMPOSED ON LABORATORY OPERATOR

A fine of $500 and two months in the county jail was the sentence imposed by the Cook County Court March 22 on Martin Clyde, a dental technician, convicted of violating the Illinois Dental Practice Act.

Mrs. Eva Mae Diggs, the complainant, testified that she went to Mr. Clyde's laboratory, which he operates under the name of Tru-Tone Dental Laboratory, to have two teeth extracted. She testified that Mr. Clyde tried but failed to extract one of her teeth, then referred her to a dentist to complete the operation.

Mr. Clyde is one of 25 defendants in an injunction suit brought by the Chicago Dental Society, which is now pending in the Superior Court of Cook County.

MICHIGAN SOCIETY ADOPTS ADVERTISING STANDARDS

The Board of Trustees of the Michigan State Dental Association has adopted official "Advertising and Exhibits Standards" for acceptance of advertising in its journal and for exhibits at its annual meetings.

Patterned closely after the standards of the American Dental Association, the Michigan code provides, among other things, that the product to be advertised or exhibited must be related to the field of dentistry, that it must not have been judged worthless by the A.D.A. or the Michigan Association, and that the claims made for it must not violate law.

"KEEP 'EM SHINING" IS TITLE OF TV PROGRAM

"Keep 'Em Shining" was the title of a half-hour program televised state-wide in Ohio February 21 and presented by the Cleveland Dental Society, the Cleveland Health Museum and the Academy of Medicine of Cleveland. The program was sponsored by the Standard Oil Company of Ohio.

TV viewers were told how teeth grow and how important are good diet and good habits of oral hygiene. The benefits of fluoridated drinking water also were discussed. As for the benefits to dental health claimed for special ingredients in tooth paste, the program said, "Experiments have not yet shown results which dental research can accept."

Digests of the program may be had from the Cleveland Health Museum, 8911 Euclid Ave., Cleveland.

ADOPTS POLICY TO GUIDE DENTAL CARE IN INDUSTRY

The second Public Health Workshop on Dental Care in Industry, held January 22 and sponsored by the First District Dental Society of the State of New York in collaboration with the postgraduate medical school, Institute of Industrial Medicine, New York University, adopted several resolutions on policy for industrial dental programs.

Pointing out that the participation of the dentist as an active and functioning member of the health team in the industrial health program will produce the maximum results, the resolutions put the First District Dental Society on record to help guide the formulation and administration of industrial dental programs in New York.

Resolutions on needed changes in dental provisions of existing workmen's compensation laws, adopted last year, were reintroduced and reaffirmed.

Serving as chairmen of the panels were Edward R. Aston, Harry Strusser, Michael S. Burnham, Seymour L. Nash, Oscar Jacobson and Rufus L. Robinson.

HEALTH EDUCATOR EMPLOYED BY CALIFORNIA SOCIETY

The Dental Health Education Committee and the Executive Committee of the California State Dental Association have approved the employment of a dental health educator for the Association. He is Wayne H. Jepson, presently director of health education for the Salt Lake City Health Department. Mr. Jepson will take up his new duties April 1. The education program will be tied in with the programs of community groups.

W. H. Jepson

California is the first state society to hire a full-time dental health educator, it is believed.

WASHINGTON SOCIETY SELECTS ROBERT E. PAULSEN SECRETARY

Robert E. Paulsen, past executive secretary of the Prescott, Arizona, Chamber of Commerce, has been chosen by the Washington State Dental Association to fill the newly created post of executive secretary.

R. E. Paulsen

Mr. Paulsen is a graduate of Wisconsin State Teachers' College, and has held several managerial positions with various chambers of commerce during the past eight years.

The new secretary has taken graduate work at the Universities of Wisconsin, Michigan and Colorado and has taught and coached in high schools in Arizona and Montana.

DENTAL HEALTH DAY ACTIVITY EXTENSIVE, REPORTS SOCIETY

The governor of New Mexico proclaimed the first week of February Children's Dental Health Week, and the city of Albuquerque was the scene of extensive activity in connection with the event, reports the Albuquerque District Dental Society.

Spot announcements were carried by three radio stations. A 15 minute panel discussion was presented on TV. Films were shown to 50 PTA's. Articles appeared in the morning and evening pa-

pers. The city transit busses carried posters, and the Public Electric Service Company placed an American Dental Association health education exhibit in its window.

AKRON SOCIETY BOOTH POPULAR AT EXPOSITION

The Akron Dental Society reports that a dental booth run under its auspices at the three day health exposition of the Women's Auxiliary of the Summit County Medical Society proved to be one of the most popular booths of the exposition.

Bitewing roentgenograms were offered free to school children by the Society at its booth. A total of 1,486 roentgenograms were taken. Each child was given his roentgenogram in an envelope to take to his dentist for free developing and diagnosis; the envelope was marked "Compliments of the Akron Dental Society." The Society also distributed pamphlets on dental health.

FLORIDA SOCIETY SERVES 2,500 AT STATE FAIR

Some 2,500 children, between the ages of 5 and 13, received roentgenograms free of charge during the ten days of the Florida State Fair in February.

The Society, in cooperation with the State Board of Health, rented space at the Fair grounds. The Society, the Board, and a dental supply firm provided equipment and film. Society members donated their services.

The efforts of the dentists were noted by a leading Tampa merchant, who devoted one third of his full page advertisement in a Sunday edition of the largest Tampa newspaper to tell the public about it. Said the advertisement, "Here is a demonstration of good citizenship that makes you proud to know your dentist."

RECORD ATTENDANCE AT MASSACHUSETTS MEETING

More than 500 dentists attended the midwinter educational meeting of the Massachusetts Dental Society held in Boston February 1 and 2. Highlight of the meeting was the symposium entitled "General Anesthesia for All Procedures."

Certificates honoring the 130 Massachusetts men who have practiced dentistry 50 years or longer were presented by Daniel F. Lynch, A.D.A. president-elect. Harold Hillenbrand, Association secretary, awarded Savings Bonds to school children who participated in a poster contest run state-wide by the dental society.

Dental Education

MYRON S. AISENBERG NAMED DEAN AT MARYLAND

Acting President T. B. Symons of the University of Maryland has announced the appointment of Myron S. Aisenberg as dean of the Baltimore College of Dental Surgery. Dr. Aisenberg had previously been acting dean.

He is a diplomate of the American Board of Oral Pathology and a past president of the national chapter of Alpha Omega. He is a member of the American College of Dentists and the International Association for Dental Research.

STATE DENTAL COLLEGE BARRED BY NEW YORK BOARD

New York's board of trustees of the State University, governing body of the state's colleges, decided in February against establishing a state college of dentistry at this time. Its decision followed the recommendation of its committee on medical education.

It has been reported that the dental school of the University of Buffalo has expanded its facilities through the construction of a new building. The College of Dentistry of New York University anticipates similar expansion.

The trustees approved the establishment of a new department of dental medicine and surgery at the State University medical colleges in Brooklyn and Syracuse designed to give medical students an understanding of "the whole picture of comprehensive health care."

JOHN E. BUHLER TO HEAD DENTAL SCHOOL ASSOCIATION

John E. Buhler of Emory University was elected president of the American Association of Dental Schools at its meeting held in French Lick, Ind., March 21-24.

Other officers elected at the Association's meeting are: Harold J. Noyes of the University of Oregon, president-elect; Lee Roy Main of St. Louis University, vice-president; Marion W. McCrea of the University of Maryland, secretary-treasurer, and Allan G. Brodie of the University of Illinois, executive committee member. H. Henry Weisengreen of the University of California was nominated to the Council of the National Board of Dental Examiners and Gerald D. Timmons of Temple University to the Council on Dental Education.

The 1955 meeting will be held March 21-23 at the Morrison Hotel, Chicago. In 1956 the Association will meet at the Jefferson Hotel, St. Louis, March 26-28.

DENTAL SCHOOLS SCHEDULE GRADUATE COURSES

California • A general review course in dentistry will be offered for eight weeks, starting April 19, by the University of California Extension.

Didactic lectures in the following subjects will be given; anatomy, anesthesia, bio-chemistry, chemistry, (both organic and inorganic), crown and bridgework, dental materials, histology, materia medica, metallurgy, operative dentistry, orthodontia, oral diagnosis, oral surgery, pathology, pedodontia, prosthetics, physiology, roentgenology and therapeutics.

More than one half of the time will be devoted to laboratory technics and clinical procedures with patients.

Further information may be obtained from J. Eugene Ziegler, head of the dental program of the University, 815 South Hill Street, Room 211, Los Angeles 14.

Louisville • The University of Louisville School of Dentistry in cooperation with the Louisville General Hospital announces two six months' courses in general anesthesia for graduate dentists. Trainees have the same privileges as first year residents in anesthesia and are required to administer anesthetics for both major and minor surgery as well as for dental anesthesia.

Upon the student's completion of the course, the American Board of Oral Surgery may grant three months' credit toward the clinical requirements of the Board.

The courses begin September 1 and March 1. Further information is available from the School of Dentistry, University of Louisville, Louisville, Ky.

Michigan • Two fellowships in graduate dentistry for children have been made available by the Charles Stewart Mott Foundation of Flint, Mich.

Each fellowship provides for 12 months of formal graduate study at the University of Michigan from September 1954 to August 1955 with a living stipend of $150 per month.

After this amount of formal instruction, the candidate agrees to provide a year of dental service in the Children's Clinic of the Mott

Foundation Children's Health Center, Hurley Hospital, Flint, Mich., at a salary of $4,400 for the year.

During this period, a research problem may be completed and reported in a thesis for the Master's degree.

Further information may be obtained from Kenneth A. Easlick, School of Dentistry, University of Michigan, Ann Arbor, Mich.

New York University • New York University College of Dentistry has expanded its curriculum of postgraduate instruction. During the month of June two courses in periodontics will be given, as well as courses in complete denture prosthesis, partial dentures and pulp canal therapy. These courses run two and three weeks, and will include lectures and clinical experiences. A one week review course in periodontics is limited to students with previous instruction in the field.

Further information may be had by writing to the secretary of the postgraduate division of the College of Dentistry.

North Carolina • North Carolina School of Dentistry has announced its graduate program in orthodontics, oral surgery and pedodontics. The curriculum is planned to meet the educational and experience requirements for the respective specialty boards, and the programs lead to a Master's degree or a certificate.

Students are admitted in orthodontics and pedodontics in June each year; admission for the study of oral surgery is scheduled for September.

Further information may be had by writing to the dean, School of Dentistry, University of North Carolina, Chapel Hill, N. C.

Northwestern • An advanced course on cephalometric radiography will be presented June 7-9 by the graduate department of orthodontics of Northwestern University Dental School. Emphasis will be placed on serial cephalometrics (a study of headplates taken before, immediately after, and some years subsequent to orthodontic therapy), and on functional cephalometrics, including analysis of mandibular displacement, vertical dimension problems and temporomandibular joint dysfunction. Further information may be obtained from the director of graduate and postgraduate courses, Northwestern University Dental School, Chicago.

Southern California • A comprehensive review in dentistry is being scheduled by the University of Southern California School of Dentistry May 3 to June 11. Sixteen subjects will be reviewed. The course will include practical experience in technics of operative dentistry, prosthesis and fixed prosthesis. The tuition fee is $550. Further information is available from Francis J. Conley, director of the School of Dentistry, University of Southern California, Los Angeles.

Tennessee • Two postgraduate programs are being offered during April by the University of Tennessee College of Dentistry. Albert G. Richards, of the University of Michigan School of Dentistry, will be guest instructor for a course in dental radiography April 5-9, and John W. Geller of Indianapolis will be guest instructor for the course in full denture prosthetics to be held April 19-23.

Assisting the guest instructors will be Joe Hall Morris, Milton Siskin, Barton McGhee, Samuel C. Morgan and Herman C. Levitch of the College of Dentistry faculty.

Further information may be obtained from the postgraduate department of the College, Memphis, Tenn.

Tufts • Two courses in occlusal rehabilitation have been announced by Tufts College Dental School postgraduate division. The first, a lecture and seminar course, will be offered Monday through Friday, September 20-24, 1954.

The second, a special participation course, will meet every other week, Fridays and Saturdays, for seven months beginning October 15, 1954. Louis Alexander Cohn is instructor for both courses. Further information may be obtained from Tufts College Dental School, 136 Harrison Avenue, Boston.

National Defense

GENERAL SNYDER NOMINATED AS DENTAL CORPS CHIEF

Brig. Gen. Oscar P. Snyder, former vice-president of the Association, has been nominated as chief of the Army Dental Corps to succeed Maj. Gen. Walter D. Love, who is scheduled for retirement.

General Snyder is now director of dental activities at Brooke Army Medical Center at Fort Sam Houston, Texas. Previously, he was in charge of dental activities at the Army Medical Center at Walter Reed General Hospital. General Love has headed the Army Dental Corps for nearly four years.

Maj. Gen. George E. Armstrong, the Army surgeon general (left) opens the new Central Dental Laboratory building at Walter Reed Army Medical Center February 16. Col. Lynn C. Dirkson, commanding officer of the laboratory, assists. Among the guests were Daniel F. Lynch and C. Willard Camalier of the American Dental Association and Francis J. Fabrizio, president of the District of Columbia Dental Society.

C. RAYMOND WELLS PROMOTED TO REAR ADMIRAL POST

Capt. C. Raymond Wells, president of the American Dental Association in 1943-44, has been promoted to the grade of Rear Admiral, Dental Corps, U.S. Naval Reserve. He is the first Naval Reserve dental officer to be named to this rank.

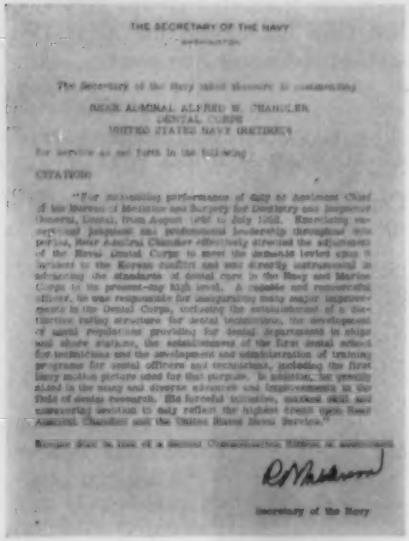
C. Raymond Wells

ARMY SEEKS CHANGE IN DOCTOR DRAFT LAW

Hearings were held last month on a proposed amendment to the doctor draft law introduced in the Senate for the Armed Forces by Sen. Leverett Saltonstall (R.). It would allow the Armed Forces to use persons inducted under the act in their professional capacities on a noncommissioned basis.

The proposed amendment reads, "Any person heretofore or hereafter inducted or ordered to active duty under the authority of this act who fails to qualify for or accept a commission, or whose commission is terminated, may be utilized in his professional capacity in an enlisted grade or rank."

The change, written with the reper-



THE SECRETARY OF THE NAVY

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The Secretary of the Navy takes pleasure in commending

REAR ADMIRAL ALFRED W. CHANDLER
DENTAL CORPS
UNITED STATES NAVY (RETIRED)

for service as set forth in the following

CITATION:

"For outstanding performance of duty as Assistant Chief of the Bureau of Medicine and Surgery for Dentistry and Inspector General, Dental, from August 1950 to July 1953. Exercising exceptional judgment and professional leadership throughout this period, Rear Admiral Chandler effectively directed the administration of the Navy Dental Corps to meet the demands levied upon it incident to the Korean conflict and was directly instrumental in advancing the standards of dental care in the Navy and Marine Corps to its present-day high level. A capable and resourceful officer, he was responsible for instituting many major improvements in the Dental Corps, including the establishment of a distinctive rating structure for dental technicians, the development of dental regulations providing for dental departments in ships and shore stations, the establishment of the first dental school for technicians and the development and administration of training programs for dental officers and technicians, including the first Navy motion picture used for that purpose. In addition, he greatly aided in the many and diverse advances and improvements in the field of dental research. His forceful initiative, outstanding skill and unswerving devotion to duty reflect the highest credit upon Rear Admiral Chandler and the United States Naval Service."

[illegible]

Secretary of the Navy

Rear Admiral Alfred W. Chandler, a past vice-president of the American Dental Association and former assistant chief of the Bureau of Medicine and Surgery for Dentistry, United States Navy, has been awarded this special letter of commendation by the Secretary of the Navy. During the six years Admiral Chandler headed the Dental Corps, the citation states, he displayed "exceptional judgment and professional leadership."

cussions of the Peress case echoing in Congress and the Pentagon, actually was prompted by a court decision favoring another dentist, Herbert L. Nelson. The court upheld Dr. Nelson's contention that under the 1953 amendments to the special registration law he should be released from service if the Army did not grant him a commission. (See "Washington News Letter" in THE JOURNAL, March issue.)

ARMY ISSUES DENTAL STUDENT PROGRAM

Schools of dentistry throughout the United States have been officially notified of the opportunities for participation in the Army's senior dental student program for 1954-55. The program is open to students who have completed their junior year.

Those selected will be tendered commissions and orders concurrently with their enrollment as seniors this fall. They will be commissioned as second lieutenants in the Medical Service Corps of the Army Reserve and placed on active duty with full pay and allowances while they continue their dental studies in the schools in which they are enrolled.

On graduation, these officers will be appointed first lieutenants in the Dental Corps of the Army Reserve and may be offered commissions in the same grade in the Regular Army Dental Corps. After appointment in the Dental Corps they will serve on active duty at least two years.

Research

PAFFENBARGER ELECTED I.A.D.R. PRESIDENT

George C. Paffenbarger, director of the Fellowship Division of the American Dental Association at the National Bureau of Standards, was elected president of the International Association for Dental Research at its meeting March 19-21 in French Lick, Ind.

Selected for president-elect was Paul E. Boyle of the University of Pennsylvania. Other officers are: Joseph F. Volker of the University of Alabama, vice-president; Edward H. Hatton, professor emeritus of Northwestern University, secretary-treasurer; Dan Y. Burrill of the University of Louisville, assistant treasurer, and Harold C. Hodge of the University of Rochester, trustee. Elected to the publications committee were: Hamilton B. G. Robinson of Ohio State University, Frank Hall of Ohio State University and Dr. Boyle.

Public Health

CHRONIC ILLNESS COMMISSION FAVORS FLUORIDATION

Pointing out that dental caries is an important chronic disease because of its destructiveness and prevalence and because loss of teeth complicates the life of aged or disabled persons, the Commission on Chronic Illness at its meeting March 18 adopted a statement which urged American communities to fluoridate their drinking water.

This action followed a study made by the Commission in which it reviewed and evaluated available evidence on the advantages and the alleged dangers of fluoridation. "Extensive research into the toxicology of fluorine compounds," said the Commission statement, "has revealed no definite evidence that the continued consumption of drinking water containing fluorides at a level of about 1 ppm is in any way harmful to the health of adults or those suffering from chronic illness of any kind."

The committee of scientists which made the Commission's study was headed by Dr. Kenneth W. Maxcy, professor of epidemiology, Johns Hopkins University School of Hygiene and Public Health.

BUREAU OF STATE SERVICES OF USPHS REORGANIZED

The Division of Dental Public Health is being retained in a reorganization of the Bureau of State Services of the United States Public Health Service. The Bureau of State Services, which is responsible for federal public health programs at the state, interstate and international levels, was formerly divided into 16 operating divisions. Under the new set-up, there will be only 7 divisions.

In effect, therefore, the Division of Dental Public Health has increased in stature, since it now stands as 1 of the 7 major divisions instead of 1 of 16. The functions and responsibilities of the Dental Division have not been changed. Thomas L. Hagan continues as chief and Donald J. Galagan continues as assistant division chief.

NEW YORK ASSEMBLY RECEIVES BILL ON FLUORIDATION

A bill to require the fluoridation of all present and future public water supplies in the State of New York was introduced in the New York Assembly January 26 and was referred to the Committee on Conservation.

The bill reads in part: "The commissioner, after consultation with the commissioner of health and recognized medical and dental authorities, shall require the fluoridation of every existing and future source of public water supply and water storage reservoir furnishing water for human consumption, and shall adopt, amend and enforce rules and regulations therefor." The act, if passed, will take effect July 1.

NEW YORK WANTS SUPERVISOR FOR DENTAL HEALTH SERVICES

The position of Supervisor of Dental Health Services in the New York State Education Department is now open, it has been announced. Applications will be accepted up to April 9 by the State Department of Civil Service.

Candidates must have four years' experience in practicing dentistry or dental administration and be eligible for a license to practice dentistry in New York State. They must also be residents of the State. The starting salary is $6,801.

Further information may be obtained from the Department of Civil Service in Albany.

INDUSTRIAL DENTISTS TO DISCUSS FACTORY PROGRAM

The growing importance of dental health in American industry and the place it holds in the industrial health program of the nation will be discussed during the Industrial Health Conference, scheduled for April 27-29 in Chicago.

Attention will focus on industry as an area for dental health education when Perry Sandell of the A.D.A. Division of Dental Health Education opens discussion the second morning of the conference. Dentists participating in the program are C. R. Fricke of Pittsburgh and Lyman D. Heacock, chief of dental service, Veterans Administration Hospital, Nashville, Tenn.

Secretary of the American Association of Industrial Dentists, Edward R. Aston, has announced that the program will include a tour of a large industry where a dental program is being conducted.

HEALTH PERSONNEL DISCUSSED BY NATIONAL FORUM

The 1954 National Health Forum held in New York March 24-26 as part of the 34th annual meeting of the National Health Council discussed "Changing Factors in Staffing America's Health Services." The National Health Council is a coordinating body among 42 national organizations and professional societies in the health field.

The Forum discussed the problem of how to assure adequate health personnel for the nation.

Harold Hillenbrand, executive secretary of the American Dental Association, served on the Forum committee. Representing the Association at the conference were Shailer A. Peterson of the Council on Dental Education, W. Philip Phair of the Council on Dental Health and B. Duane Moen of the Bureau of Economic Research and Statistics.

International

PERMANENT DENTAL OFFICER FOR WHO URGED BY F.D.I.

A permanent dental officer for the World Health Organization as part of a four point dental health program was urged by the Fédération Dentaire Internationale at a meeting of the WHO executive board in Geneva, Switzerland, in January and February.

After the visit of Gerald H. Leatherman, F.D.I. secretary-general, and J. Stork, its honorary treasurer, the WHO executive board adopted a report which said in part that, although the WHO was already carrying on a considerable amount of dental work, especially in connection with maternal and child health, nutrition and environmental sanitation projects, "the time had come when special attention should be given to the promotion of dental health programs."

The four point program recommended by the F.D.I. urged work in the fields of oral hygiene, manpower, dental care for children and the appointment of a permanent dental officer to coordinate the dental health activities of the WHO.

MEXICAN DENTAL ASSOCIATION ELECTS DIRECTORS

The following have been elected to the board of directors of the Asociación Dental Mexicana for the period 1954-1955: Germán Sánchez Cordero, president; Roberto M. Ruff, vice-president; Manuel Garrido, secretary of the interior; Alicia Lazo de la Vega, secretary of the ex-

Among the guests at the President's Banquet of the convention of the Colegio de Cirujanos Dentistas de Puerto Rico held January 28-30 were Francis J. Garvey of the American Dental Association Council on Legislation, president Leslie M. FitzGerald, Mrs. FitzGerald and Senator Lester C. Hunt. Sitting in front of Senator Hunt is José M. Gonzéles, president of the Colegio.

terior; Gloria Stella Martínez, treasurer; Pedro Villalón, secretary of the interior, and Erik Martínez Ross, assistant secretary of the exterior.

WHO TO HOLD FIRST DENTAL HEALTH SEMINAR

Close to 50 representatives from 21 countries of the Western Pacific, Southeast Asian and Eastern Mediterranean regions of the World Health Organization will attend the first dental health seminar ever held by that organization. The seminar will be held in New Zealand May 4-21, and is designed for persons responsible for planning and developing public health dental services and for those teaching professional workers in the public health field.

A faculty of seven consultants has been appointed to plan the professional and scientific program of the seminar. Prof. C. L. Bailey, professor of education at Victoria University College, Wellington, New Zealand, will head the faculty. The consultants are F. A. Arnold of the United States, C. F. Mummery of Malaya, G. T. Parfitt of Great Britain, J. L. Saunders of New Zealand, K. L. Shourie of India, G. Toverud of Norway and J. P. Walsh of New Zealand.

Topics to be discussed include the use of fluorides in prevention of dental caries, dental health services in less advanced countries, dental care as an integral part of modern public health services, training of public health personnel and the cause of periodontal disease.

200 SUBSCRIBERS NEEDED FOR F.D.I. BILINGUAL JOURNAL

About 200 additional subscribers to the Fédération Dentaire Internationale journal would make possible the publishing of the journal in two languages. The journal, now published only in English, would then be published in German. The F.D.I. hopes to publish in French also.

Information about the journal may be obtained from G. H. Leatherman, secretary general, F.D.I., 35 Devonshire Place, London, W.I., England.

F.D.I. LISTS MEETINGS OF VARIOUS COUNTRIES

The Fédération Dentaire Internationale has listed meetings in various parts of the world which it considers of interest to dentists. These meetings will take place in the coming months. The list includes the date and place of each meeting, as well as the person to whom inquiries may be addressed.

The Federation itself will meet at the Scheveningen, The Hague, June 8-13, to discuss the prevention of dental disease.

"THE NURSE—HEALTH PIONEER" IS WORLD HEALTH DAY THEME

"The Nurse—Pioneer of Health" is the theme chosen for World Health Day to be celebrated April 7, it has been announced by the World Health Organization. The year 1954 marks the 100th anniversary of Florence Nightingale's visit to the war-front hospitals in the Crimea.

The World Health Organization has pointed out that two thirds of the world's people live in underdeveloped areas where the life expectancy is 30 years and that there are parts of the world where the ratio of physicians and professionally trained nurses is less than 1 to 100,000 persons. One of the functions of WHO is to help train professional health workers.

Cong. Ass. des Lic. et Dent. Univ.	May 26-31	Knocke sur Mer	Inquiries to F. Noterman	141 Av. Carton de Wiart Brussel
Journ. Odonto Stomat. de Bruxelles	June 11-15	Brussels	F. de Wals	166 Chaussée d'Etterbeek, Brussels
Annual Meeting of Canadian Dental Association	September 1-8	St. Andrews by the Sea	D. Gullett	234 St. George St., Toronto, Ontario
29th Congr. of Dental Stomatologists	September 13-18	Venice	A. Benagiano	44, Via Salaria, Rome
Jubilee Congress, 3 Dutch Societies	June 8-14	Scheveningen The Hague	G. Arnold	1 Adriaan Goekooplaan, The Hague
Annual Meeting British Dental Association	May 10-15	Blackpool	H. Parker Buchanan	13 Hill St., Berkeley Square, London W. 1
XIVth Int. Cong. of Milit. Medicine & Pharmacy	April 20-28	Buenos Aires, Arg.	Secretariate Organizing Committee	Direccion General de Sanidad Militar, Pozos 2045, Buenos Aires (Arg.)
Int. Stomatol. Meetings of Turin	May 30 June 6	Turin Italy	Prof. B. Roccia	University of Turin
Int. Assoc. of Dental Students	September 9-16	Groningen Utrecht, Netherlands	Mrs. L. Keyser	5 Jutphaaseweg, Utrecht
European Orthodontic Society	July 1-6	Eastbourne Great Britain	Norman Gray	16 College Road, Eastbourne
American Dental Society of Europe	July 6-9	Paris, France	J. Molony	110 Harley St., London W. 1
Federation Dentaire Internationale	June 8-13	Scheveningen The Hague, Netherlands	G. Arnold or Sec. General F.D.I.	1 Adriaan Goekooplaan, The Hague 35 Devonshire Place, London W. 1

General

CALIFORNIA DENTIST DIES, WAS PAST A.D.A. OFFICIAL

David W. McLean, 70, who practiced for 49 years in California, died March 1 of a heart ailment.

Dr. McLean was a member of the Board of Trustees of the American Dental Association from 1939 to 1945. He was also a past president of the Los

David W. McLean

Angeles Dental Society, the Southern California State Dental Society, the United States section of the International College of Dentists and the Academy of Denture Prosthetics.

He was affiliated with the Supreme Chapter of Delta Sigma.

Originally from New York, Dr. McLean early in his career was active in dentistry in his home state. He was a past president of the Ninth District Dental Society of New York State, and served as a member of the New York State Board of Dental Examiners.

In civic affairs he was a charter member of the San Marino Kiwanis Club, past president of the Southern California Camellia Society and member of the board of directors of the American Camellia Society. He is survived by his wife Hazel and his two daughters, Mrs. R. C. Swingler and Mrs. James D. McCullough.

ORTHODONTISTS TO HOLD 50th ANNUAL SESSION

A symposium on the temporomandibular joint, moderated by John R. Thompson, professor of orthodontics at Northwestern University Dental School, and a panel on the treatment of deciduous and mixed dentition, moderated by Leuman M. Waugh of New York, are two of the featured events planned for the 50th annual session of the American Association of Orthodontists scheduled for May 16-20 in Chicago.

An international luncheon honoring Oren A. Oliver, president of the Fédération Dentaire Internationale, and Harold Hillenbrand, secretary of the American Dental Association, is also planned. Alexis W. Eastwood of London, England, will speak on orthodontic specialization within the British National Health Service.

Other events include a research section on recent orthodontic investigations and an examination by the American Board of Orthodontics.

NEW JOURNAL TO SURVEY PERIODONTIC LITERATURE

The Journal of the Western Society of Periodontology has just published its second issue. It is unique, the editor has announced, in that it is the only abstract journal in the field of periodontics. The Society plans to abstract and translate into English for the next issue a number of articles originally published in French and German. Max Shapiro is the editor.

GENERAL DENTISTRY ACADEMY LISTS 1954 OFFICERS

The second annual meeting of the Academy of General Dentistry held in Chicago February 8 elected officers for 1954. Those elected were: T. V. Weclew,

president; James Mershimer, vice-president; Joseph Ulis, vice-president, and A. L. Knab, secretary-treasurer.

The Academy of General Dentistry was formed "to inculcate in the general practitioner of dentistry a desire to improve his professional qualification through postgraduate study and to recognize his endeavors by membership in a semi-honorary organization." All members of the Academy are required to spend a minimum of 50 hours in postgraduate work at an accredited university every three years and at least 100 hours during this period at seminars, discussion groups and scientific meetings.

PROMINENT MARYLAND DENTIST, B. LUCIEN BRUN, DIES

B. Lucien Brun, a prominent figure in Maryland dentistry for almost half a century, died in Baltimore February 19.

Dr. Brun had been associated with the dental department of Johns Hopkins Hospital from its beginning in 1912 until his retirement in 1950. He served as head of the division of oral surgery until 1946 at which time he became chief of the dental department.

B. Lucien Brun

He was also a member of the faculty of the Baltimore College of Dental Surgery. As chairman of the Dental Centenary held in Baltimore in 1940, Dr. Brun directed what has been described as one of the greatest meetings in the history of dentistry.

Through his work in oral and facial surgery in World War I, Dr. Brun demonstrated the value of having dentists trained in oral surgery. For his work in World War II he received the Congressional Selective Service Medal.

Dr. Brun was a past vice-president of the American Dental Association. He was also a member of the Maryland State Board of Dental Examiners and a diplomate of the American Board of Oral Surgery.

APPOINTMENTS OPEN AT ST. ELIZABETHS HOSPITAL

Appointments as dental intern are open for July 1 at Saint Elizabeths Hospital in Washington, D. C. The dental department of the hospital is approved by the American Dental Association as meeting its basic standards of hospital dental service. A certificate will be granted on successful completion of one year's training. The salary is $2,800 a year. Further information may be obtained from Earl B. Frank, chief of the Dental Service.

PACIFIC COAST CONFERENCE ANNOUNCES SPEAKERS, PROGRAM

The program and the roster of speakers for the ninth Pacific Coast Dental Conference are now available to interested dentists. The Conference, which is to be held at Banff, Alberta, Canada, June 1-5, will feature as essayists Hamilton B. G. Robinson, associate dean of the Ohio State dental school; W. G. McIntosh, assistant professor of periodontics at the University of Toronto, and L. W. Peterson, professor of oral surgery, Washington University. Among the lecturers are S. C. Robinson of Portland, Ore.; F. L. Jacobson of the University of Washington School of Dentistry and H. R. Mac-

Lean, professor of operative dentistry, University of Alberta.

Since the town of Banff provides a variety of facilities for the sports enthusiast, the dentist can combine his vacation and his Conference attendance.

BOARD OF ORAL PATHOLOGY NAMES NEW OFFICERS

New officers named by the American Board of Oral Pathology at its annual meeting February 8 are: Henry M. Goldman, president; Joseph L. Bernier, vice-president, and Paul E. Boyle, secretary-treasurer. The following candidates were certified as diplomates of the Board: Marvin S. Burstone, Maj. Richard W. Tiecke and Patrick D. Toto.

LONGSHORE UNION RECOMMENDS DENTAL CARE PROGRAM

Leaders of the International Longshoremen and Warehousemen's Union (independent) recommended February 9 a $750,000 dental care program for members' children. The union's Pacific Coast caucus recommended the use of money from its welfare fund if employer members of the fund's board of trustees approve.

A one year test of the program would be carried on for members' children between the ages of 4 and 14 years in San Francisco, Portland, Los Angeles and Seattle. The test would provide figures for a possible insurance plan. Union members would have their choice of dentists, it has been reported.

TWO THEMES PICKED FOR PITTSBURGH MEETING

"Dental Care for the Child" and "The Psychiatrist Looks at Dentistry" are the two themes selected for the seventh annual dental health conference which is sponsored jointly by the School of Dentistry of the University of Pittsburgh and the Odontological Society of Western Pennsylvania. The conference will be held April 28 in the Mellon Institute, Pittsburgh.

Among those participating in the panel discussions are Warren R. Sisson, pediatrician of the Forsythe Dental Clinic; John C. Brauer, dean of the University of North Carolina Dental School; Benjamin Spock and Frederick L. Weniger, psychiatrists from the University of Pittsburgh.

NATIONAL DENTAL BULLETIN TAKES ON NEW LOOK

The *Bulletin of the National Dental Association* has taken on a new look under C. O. Dummett, its new editor. Its new design is in keeping with the constantly improving standards of dental journalism and modern typographical trends.

Also . . . Seattle will play host to the 1954 meeting of the Pacific Coast Society of Prosthodontists May 29 and 30. . . . The alumni society of Temple University School of Dentistry will hold its 90th annual meeting May 12 in Philadelphia. . . . *The Fluoridation Story,* an illustrated leaflet printed in large type, has been prepared by the Georgia Department of Public Health. . . . J. Lorenz Jones, Arthur E. Smith and John W. Wilson have been elected president, president-elect and secretary-treasurer, respectively, of the Southern California Society of Oral Surgeons. . . . April 9-11 are the dates of the national convention of Sigma Epsilon Delta to be held in Lakewood, New Jersey. . . . Fluoridation began March 9 in Tiel, Holland, population 15,000. . . . The Great Lakes Society of Oral Surgeons will meet in Toronto, Canada, May 1 and 2.

International Correspondence

NEWS FROM GREAT BRITAIN

A question frequently asked by visitors is the exact procedure followed when a person in England decides to seek dental treatment under the National Health Service. Jack Gilbert gives us the following answer.

One may consult a practitioner from whom he has had treatment in the past, or he may choose a dentist from the local lists available at post offices, town halls and other centers, which contain the names and addresses of the dentists in the area prepared to provide treatment under the Health Service. Assuming that he is not in need of emergency treatment, the patient's name, address and other information are entered on a form specially supplied to all on the dental lists. The patient's mouth is then examined and a chart completed giving a detailed report of his dental condition and an assessment of all the treatment and appliances the dentist considers necessary to restore dental fitness. In general, if the patient needs treatment other than simple scaling, fillings, root treatment or extractions not involving the supply of dentures and repairs to a maximum value of £1. 15. 0., then the completed form must be sent to the Dental Estimates Board for approval. Only when approval is received can treatment proceed.

Treatment normally must be completed within six months, or in nine months if dentures are involved, though extensions for valid reasons such as periods of illness are usually readily given. When the treatment is completed, the patient signs on the form a section stating that, to his knowledge and belief, the treatment has all been completed satisfactorily; and the completed form is finally forwarded to the Dental Estimates Board for its authorization of payment to the practitioner.

DENTAL EDUCATION

I have had two interesting contributions dealing in general terms with the broader aspects of dental education in Great Britain. Sir Wilfred Fish writes that the Board of Faculty of Dental Surgery of the Royal College of Surgeons of England has just completed a revision of its syllabus of requirements for candidates for the License in Dental Surgery. This has been rendered necessary by a revision of the recommendations concerning the dental curriculum by the General Medical Council.

There are 15 licensing bodies in the United Kingdom, of which the Royal College of Surgeons is one; they naturally have varying standards and views as to the extent of such courses of study as will render a dentist fit to practice. Parliament has, however, recognized for many years that it was necessary to regulate the standard of dental education for the public benefit and safety.

The act of 1878, which was passed for the purpose, *inter alia*, of regulating the qualification of practitioners in dentistry, also put the responsibility of maintaining this standard on the General Medical Council. In order to carry out its duties, the Council publishes recommendations as to courses of study, which indicate in general terms the extent of the courses of study and the nature of the examinations which, in their opinion, represent the minimum requirement to qualify a man to practice dentistry. Every five years or so the Council sends visitors to sit in at the examinations of all 15 licensing bodies. These visitors report back to the Council as to whether, in the light of the Council's recommendations, the examination is "sufficient." Some correspondence between the Council and the licensing body follows, and any difference of opinion is adjusted, though the General Medical Council has the duty to report to the Privy Council if no solution is found. The Council does not seek to interfere with the way men are taught but only to ensure that the curriculum contains the irreducible minimum of training which candidates should undergo.

Perhaps the most interesting feature for overseas colleagues of the recent revision by the College is that foreign qualifications in dentistry may be accepted as conferring exemption from a considerable part of the study and from some of the examinations, but in all cases one academic year of study and an examination are required by the Royal College of Surgeons before a candidate may receive his License in Dental Surgery. This year of study will generally include attendance at a general hospital and a six months' course in general medicine and surgery.

SCHOOL AND HOSPITAL STAFFS

Prof. H. H. Stones sends us the following information on the staff of dental schools and hospitals in Great Britain.

Until recently the senior staff of the hospital was composed of prominent men in practice in the vicinity who attended the dental hospital usually for one half day a week. In many centers there have been 11 of these honorary dental surgeons so that there were surgeons for the whole working week. These were the men who were originally responsible for the clinical teaching of dental students, and it was customary also for certain members who were particularly interested in any particular dental subject to give the academic lectures. In addition there were junior appointments, as for demonstrators and house surgeons, the holders being men who had recently qualified and who attended full time or half time. In a school of about 150 students, about half of whom would be engaged in clinical studies, the numerical strength of the full-time junior staff was often limited to 3 or 4. The teaching of dental mechanics, a term used for the technical procedures involved in making all types of removable prostheses and bridge work, was undertaken by technicians who did not have a dental qualification. The change that has occurred in the teaching of dental mechanics is that qualified dentists do more of the teaching, though technicians still do the bulk of the practical instruction.

A practice of having one or two more senior full-time teaching appointments started about 30 years ago, and the first full-time professorship of dental surgery was established in 1920. There are 16 dental schools in Great Britain and Northern Ireland, 5 being in London; all but 3 have a professor. Concomitantly with the establishment of these senior academic appointments, there has been a considerable increase in the number of intermediate and junior full-time teaching posts of various grades.

The number of full-time university appointments varies in different schools; an average for a school of 200 students, which includes those engaged in predental studies or basic sciences, would be about 14 to 20. In a few schools some of the teaching is still done by a part-time staff. In any case, the increase in the ratio of teachers to students, counting one full-time teacher as the equivalent of two half-time teachers, is a start in a direction that is essential in view of the extending scope of dentistry and the special knowledge that is required to teach the various branches adequately.

In the associated dental hospital full-time appointments have likewise increased in number since the passing of the 1948 Act. The original senior staff of part-time honorary dental surgeons has usually been retained; the men serve as consultants or senior hospital dental officers. Some hospitals have added one or two full-time posts of either of these grades. In addition, in each hospital other full-time appointments include registrars who have a few years' experience and a varying number of house surgeons who are recruited from the newly qualified surgeons. Though individuals holding hospital appointments are concerned chiefly with the treatment of patients, those of the senior and registrar grades also undertake some teaching.

NEWS OF GENERAL INTEREST

On January 25, R. J. Last, F.R.C.S., professor of applied anatomy of the Royal College of Surgeons of England, gave a lecture to the odontological section of the Royal Society of Medicine on "The Functional Role of the Muscles of the Mandible." R. Grewcock, honorary secretary of the section, has sent me the following notes on the lecture.

Extreme interest was aroused, not only by the lucid exposition of the lecturer, but also by his disbelief in the theory advanced by Brodie to explain head posture. Last's conception of muscles as having specific function was illustrated by three postulates; namely, the skull moves on the spine, the mandible moves on the skull, and the floor of the mouth moves on the mandible; three distinct movements for the activation of which are provided three separate sets of muscles. More widespread examples of muscle specificity were given, and although obvious overlapping of function was expected, the lecturer was of the opinion that no co-ordinative balance could possibly exist between those muscles controlling deglutition on the one hand and the postvertebral muscles on the other.

This lecture will be published in full in the *Proceedings of the Royal Society of Medicine*.

Prof. R. V. Bradlaw's many friends in the United States will wish to congratulate him on being awarded the Howard Mummery Prize for his research in connection with oral syphilis.

Gerald H. Leatherman
D.M.D., F.D.S.R.C.S.

The Reader Comments

REPLY TO DR. BECKER

In his letter Dr. Becker takes exception to the views in my review of *Clinical Applications of Suggestion and Hypnosis* by William T. Heron. He contends, "The use of hypnosis by 2,600 dentists in this country, with a conservative estimate of 75,000 inductions, stands as irrefutable evidence that, contrary to Dr. Harper's opinion, hypnosis has been adapted to dentistry." In other words, "Fifty million Frenchmen can't be wrong."

But let us take first things first. We have established therapeutic measures in oral medicine, oral surgery and oral prosthesis by experimental, clinical and epidemiologic methods. These have been tried and found satisfactory. This does not mean, however, that we cannot try new methods. The dental profession is constantly experimenting with new methods and procedures and always welcomes any procedure that will relieve suffering. However, until a new procedure has proved itself beyond the shadow of a doubt, the profession necessarily must exercise caution in its use.

Now, hypnosis lacks the background of research that qualifies it for general dental practice. Some time ago a qualified speaker from Bellevue, addressing a New Jersey section of the Academy of Dental Medicine, cautioned the members against its use in their practices. He described it as an excellent tool for the psychiatrist but strongly advised against its use by dentists. This is in line with the belief of Dr. Heron that hypnotism should be governed by legal restrictions. That, at least, would take its further practice out of the hands of the amateurs.

In his book, *Hypnosis In Dentistry*, Aaron A. Moss gives credit to James Braid, a Scot practicing in England, for establishing the fact that suggestion is the dynamic factor in producing hypnosis. But suggestion alone does not explain all the phenomena of hypnosis, any more than does neurosis account for them. Suggestion undoubtedly is a factor in hypnotic effects, perhaps the prime factor, nobody knows; but to compare the use of suggestion in hypnotism with the methods of suggestion used by the old-fashioned family physician is a libel upon a service that is without a modern parallel.

Every once in a while hypnotism emerges from obscurity, struts for a brief period in the limelight and sinks again into obscurity. That, at least, has been its history for the past 200 years. What has caused its renascence at different periods I cannot say, any more than I can say whether its disappearances have been due to loss of interest on the part of its sponsors or to untoward occurrences in its administration. The choice of reasons is optional.

Charles Frederick Harper

ACRYLIC RESIN FILLINGS AND THE DENTAL PULP

In the March 1954 issue of the JOURNAL, H. D. Coy states that "there is sufficient evidence to show that no serious pulpal reaction can be ascribed directly to the direct resin filling. This conclusion is in direct contradiction to Grossman's summary." I should like to call attention to the paper by Dr. Coy and others (J.A.D.A., 44:251 March 1952) which includes a table showing that 5 pulp deaths occurred in 105 cases where acrylic resin fillings had been inserted. If pulp deaths can be expected in approximately 5 per cent of cases, it is a serious problem. Dr. Coy acknowledges 10 pulp deaths in his current report and adds: "there may, of course, have been other instances of pulpal involvement in the teeth of patients who did not return to the clinic."

Rather than give the impression that there were only 10 pulp deaths associated with the 1,200 fillings which were inserted, it would have been more to the point to state the percentage of pulp deaths that were observed in the patients who returned for check-up. In the 1952 report, less than one third of the patients reported for check-up. If this is equally true of the current study, then approximately 400 patients returned for check-up, and 10 pulp deaths were observed, or about 2.5 per cent.

This would still be considered a serious threat to pulp integrity, in my opinion. Of course, it is likely that fewer pulpal involvements are being observed today than a few years ago because dentists are using cement bases under acrylic fillings more often than before and because the acrylic resin filling materials themselves have been improved. I agree with Dr. Coy's final statement: "Significant improvements have been made in direct filling resins, but much is yet to be accomplished in perfecting them."

Louis I. Grossman, Philadelphia

Book Reviews

ODONTOLOGICA. FASC. 4. BEITRAG ZUR INDIREKTEN PULPAÜBERKAPPUNG MIT SERO-CALCIUM

By Fritz Kempf, Dr. med. dent. 16 pages with 16 illustrations. Basel, Benno Schwabe & Co., 1953.

This booklet, the fourth contribution to an odontological series published by the University of Basel, is a report of an experiment on the effectiveness of "Sero-Calcium" in the indirect capping of the pulp. The experiment was undertaken with the hope of providing guidance as to the amount of pulp to be removed. Though the study was carefully made, the generally favorable results reported for "Sero-Calcium" cannot be considered conclusive, since only 32 teeth were studied in the experiment.

ODONTOLOGICA. FASC. 5. DIE EINWIRKUNG VON NELKENÖL (OLEUM CARYOPHYLLI) UND EUGENOL AUF DIE PULPA

By Reinhard Koch, Dr. med. dent. 20 pages with 12 illustrations. Basel, Benno Schwabe & Co., 1953.

The fifth treatise of the University of Basel odontological series is a report of a controlled experiment comparing the effect of clove oil and eugenol on the pulp. Though clove oil proved far less irritating and usually less harmful to the pulp, there were instances of destructive changes, and the results were not definitive.

G. Nichols

EXPERIMENTAL HYPNOSIS

Edited by Leslie M. LeCron. 480 pages. Index. Price $6. N. Y., Macmillan, 1952.

Leslie M. LeCron has done a splendid piece of work in bringing together, with appropriate editorial comments, the writings of some 18 authorities on hypnosis.

There are two excellent chapters by Burgess and Moss on the use of hypnosis in dental practice.

A careful reading cannot but impress one with the fact that there remains need for much more study and research in the field of hypnosis. The possibilities seem great indeed.

The book is marred, in this reviewer's opinion, by the inclusion of Whitlow's "Rapid Method of Induction." This violent and dangerous method in which the cerebral circulation is impaired has no place in dental practice. This shocking method has been used in stage shows, but that fact is no recommendation for the medical profession.

Walter Hyde

THIRTY-SECOND ANNUAL REPORT OF THE STRONG-CARTER CLINIC

By the Strong-Carter Clinic. 48 pages with numerous illustrations and tabulations. Honolulu, Hawaii, Palama Settlement, 1952.

Few community dental programs have offered the dental profession the opportunity to evaluate long term and continuous efforts to provide dental care for children. From Hawaii comes the thirty-second annual report of the Strong-Carter Clinic. Surely a record of three decades of experience justifies some conclusions and stimulates challenging questions.

Of course, the already well-documented opinion that dental care programs are expensive is substantiated. During fiscal year 1952, a total of $69,570 was spent to treat 4,129 children, 5.5 per cent of the number enrolled in public and private elementary schools.

The average of 5.7 visits per child during the year indicates that a serious effort was made to provide fairly thorough treatment for clinic patients. The complete service which was provided for 68 per cent of the patients is interpreted to mean examination of all oral conditions, elimination of infections of dental origin, conservative treatment of all serviceable teeth, restoration of soft tissues to normal, removal of stains and deposits from teeth and instruction in oral hygiene.

The data and the narrative reports included in the brochure are convincing evidence that "the services rendered by the clinic and the dental health program sponsored by the Department of Public Instruction have alleviated suffering and improved the dental health of this community."

J. M. Wisan

COPYING AND DUPLICATING MEDICAL SUBJECTS AND RADIOGRAPHS

By H. Lou Gibson. 75 pages with 37 illustrations. 1 color transparency. Index. Appendix. Price $5. Springfield, Ill., Charles C Thomas, 1953.

This monograph like others by the same author is of superior quality. Technics described by the author are on a very high level. This book is comprehensive in its scope; technics for copying drawings, roentgenograms and Kodachromes are well described.

In Chapter IV on reflex copying, the technic described by the author is highly involved and one can "get in hot water" very readily if one follows this procedure. This reviewer doubts the need for this phase of copying.

Nothing concerning dentistry is found, and dentists will find little to interest them in the book. The monograph is highly technical, and its usefulness will be limited generally to the medical photographer.

Waldemar A. Link

GENERAL PHYSIOLOGY

By Bradley T. Scheer, Ph.D. 613 pages with 110 figures. Bibliography. Index. Price $7. New York, John Wiley & Sons, Inc., 1953.

In his own words, the author's goal has been ". . . a thorough first course in physiology which will provide an intelligible up-to-date picture of vital functions, shorn of as much irrelevant detail as possible, and yet offering a clear exposition of the nature and present status of the basic problems of physiology." His working definition of general physiology is "the analysis of physiological phenomena in terms of more fundamental concepts."

In the opinion of the reviewer, Dr. Scheer has surpassed his objective.

The first section of the book presents the physicochemical fundamentals involved in the living process so well that almost anyone could quickly learn and understand these concepts. The examples and illustrative material in this part, as well as the succeeding parts, are well chosen for their directness and interest.

The second part of the book describes the chemical processes of living tissue in a dynamic way, in terms of the preceding information. The description of enzyme action, means of study and physiological examples are concisely but adequately treated.

In the third part, the complicated and difficult concepts of energy transformation are described, illustrated and applied to cardiac and skeletal muscle with accuracy and conservatism. In this section radiant energy is discussed in terms of both its biological sources and its biological effects.

Fertilization, growth, control of development and the mechanism of differentiation are explained in Part Four. The theoretical and practical aspects are presented with liberal annotation.

Part Five is devoted to the processes of integration of the organism, from the basic properties and phenomena of the neuron to the humoral mechanisms.

Any preprofessional student would do well to have a course built around this book. All serious students of human physiology will find in *General Physiology* a wealth of basic information assembled under one cover, and all practicing dentists will find provocative and basic information in this book.

S. C. Harris

PSYCHOLOGY OF PHYSICAL ILLNESS

Edited by Leopold Bellak, M.D. 231 pages. Index. Price $5.50. New York, Grune and Stratton, 1952.

This small volume attempts to integrate psychiatric knowledge into other fields of medical practice. Twelve medical specialties and dentistry are covered by men with dual experience in psychiatry and their specialties. The essays are essentially clinical with the subject range necessitating a condensed, rather superficial approach.

Readers of THE JOURNAL will be most interested in the last two chapters "Psychological Aspects of Dentistry" and "Personality of the Physician."

In the former, Sol. J. Ewen has crammed a tremendous range of information into 21 pages. He covers both the emotional and intellectual aspects of the mouth. His case histories are well chosen.

It seems to this reviewer that he tends, however, to stress the "state of dependency" which occurs in the dental chair, and, corollary to that, minimizes the technics which assist the patient to acquire an active mastery over his anxiety.

Leon Altman concludes the book with suggestions for soul searching relative to the physician's personality. He stresses that one must be aware of feelings toward patients "before one can work with them accurately or with ease and composure."

Elizabeth Levitin

THE CLASSIFICATION AND TREATMENT OF INJURIES TO THE TEETH OF CHILDREN

By R. G. Ellis, D.D.S., F.D.S.R.C.S. Third edition. 247 pages with 164 illustrations. Index. Price $4.25. Chicago, Year Book Publishers, 1952.

Traumatic injuries to the deciduous and permanent anterior teeth may range from loss of part of a tooth to destruction of not only the teeth but also the surrounding soft and hard tissues, with accompanying horror to the victim's family and woe to the most competent practitioner.

In recent years a great deal of attention has been given to the resulting mental attitudes and implications which accompany these unfortunate accidents—esthetics, difficulties in speech and function, attitudes of playmates and anxiety of parents. Difficulties in producing a suitable restoration have also been thoroughly investigated.

The author is to be congratulated on this 240 page text filled with information on classification and treatment of these traumatic injuries and concomitant diseases of the pulp and surrounding tissues.

It is a compend for the practitioner who must of necessity treat these injuries regularly in his practice. It is a source of information for the dentist to enable him to proceed to the difficult task with greater confidence and greater assurance for the anxious parent and fearful child.

The book includes a bibliography at the end of each chapter, as well as an index at the end of the book.

Harry Strusser

PRINCIPLES OF FULL DENTURE PROSTHESIS

By E. Wilfred Fish, C.B.E., M.D., D.Sc., F.D.S.R.C.S. Fifth edition. 140 pages with 59 illustrations. Three appendixes. Index. Price $4.25. New York, Staples Press, Inc., 1952.

This book is well written except for a few lapses where it jumps from one subject to another without giving warning of the change. It could have been longer so it could cover principles which were necessarily omitted. The illustrations are clear and understandable. The use of some stereoscopic illustrations is particularly noteworthy.

The author discusses dentures on the basis of three surfaces: the occlusal surface, the polished surface, and the impression surface. Each of these surfaces is to be formed to fit some part of the mouth or of the opposing denture.

The principles involved in the formation of each surface are stated and discussed in relation to anatomy, physiology and mechanics. This is followed with descriptions of technics which are intended to apply the principles. Most of the principles set up by the author are sound, but many of the technical procedures seem to fall short of accomplishing their desired objectives. This is particularly true of the technics suggested for the occlusal surface and the impression surface.

The section on the polished surface of a denture is very complete and satisfactory in every way. The discussion of the musculature affecting the dentures does a great deal to clarify and substantiate his reasons for extending and shaping the denture the way he does.

The newly revised chapter on the tongue space and position of the teeth is excellent so far as principles are concerned. The practical applications do not give adequate consideration to such problems as vertical dimension and the location of the occlusal plane. The discussion of the relations of the teeth to the ridges is well thought out, and recognizes the important points about ridge resorption. Teeth which are set on the existing ridges do not occupy the same place the natural teeth did, and therefore function and esthetics are impaired.

The author could have revised the book further to include the use of more modern technics and materials for impressions.

The best portion of the book is the discussion of the polished surfaces of the denture and their importance to a successful denture. The inaccuracies in other sections relating to technics may be overlooked in order to gain the benefit of this excellent section of the book.

Carl O. Boucher

EVOLUTION AND HUMAN DESTINY

By Fred Kohler. First edition. 120 pages without illustration. Index. Price $2.75. New York, Philosophical Library, 1952.

After several months of conscientious effort, this writer submits a review without having read the book thoroughly. It became quite an impossible task. Even with the aid of both medical and general dictionaries, most of what I managed to read made little sense.

In all fairness, it must be admitted that this book might be well received by philoso-

phers and those directly concerned with the evolution of man. But if Mr. Kohler's purpose was to present the subject of evolution and human destiny for general reading, he missed the boat by more than a cable's tow.

Walter C. Alvarez, editor of *Modern Medicine*, has said that practically anything in medicine can be written "using such simple Anglo-Saxon words" that an average intelligent layman can understand it. It would seem that this same sound premise could be applied to writings such as *Evolution and Human Destiny*.

Mr. Kohler begins with the thought that the evolution of life is the continuation of an "evolution of chemical complexity" which necessarily must have preceded the existence of the most primitive living forms. He wants to show that there is a pattern to the evolutionary process which is the "complexification" of aggregates of matter and their eventual integration to form new entities. And, then, further development of the new entities follows the established pattern.

In the text, this sounds even more foreboding. Max Jacobs of Boston has summed up this type of situation adequately by asking, "Why do we complicate the simple when it is so easy to simplify the complicated?"

Theodore C. Levitas

DISEASE AND ITS CONQUEST

By G. T. Hollis, Hon. M.A. (Oxan.). 155 pages with foreword by Maurice Davidson, M.A., M.D., B.CH. Oxan., F.R.C.P. Lond. Index. Price $2.50. New York, Oxford University Press, 1953.

The author feels that the general public knows little of technical matters and knows even less about medicine. He feels that the medical profession has been frequently reproached for its failure to attempt to instruct the lay public. Therefore he sets down thirty-five diseases from allergies to varicose veins with essays on the cause of the disease, the method of detecting the ailment, and the method of treatment.

The volume is not a medical compendium for the masses, but is intended for educated persons. It is not a sensational presentation of the romantic aspects of medicine, although the romance is there for a sympathetic eye to discern. It is not a history of the achievements of medical science, although these form its background. No one will learn from it how to treat illness, though he will learn how illness is treated.

R. M. Walls

BOOKS RECEIVED BUT NOT REVIEWED

INTRODUCTION TO LABORATORY CHEMISTRY • By L. Earle Arnow, M.D. Fourth edition. 108 pages. 38 illustrations. 5 tables. $1.50. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis, 1953.

INTRODUCTION TO PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY • By L. Earle Arnow, M.D. Fourth edition. 508 pages. 108 illustrations. $3.75. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis, 1953.

HANDBOOK OF DIFFERENTIAL DIAGNOSIS • By Harold Thomas Hyman, M.D. 716 pages. $6.75. J. B. Lippincott Company, East Washington Square, Philadelphia, 1953.

EDUCATION FOR ONE WORLD: ANNUAL CENSUS OF FOREIGN STUDENTS IN INSTITUTIONS OF HIGHER EDUCATION IN THE U.S., 1952-53 • By Institute of International Education. 37 pages. 5 illustrations. 2 tables. Institute of International Education, 1 E. 67th St., New York, 1953.

THE SCIENTIFICALLY DESIGNED PARTIAL VENEER OR THREE-QUARTER CROWN: ITS TECHNIC, ANALYSIS, AND COMPARISON • By Walter E. Jones, D.D.S. 61 pages. Illustrated. $3. The Burgess Publishing Company, 426 S. 6th St., Minneapolis, 1952.

THE SYMPTOMS AND TREATMENT OF ACUTE POISONING • By G. H. W. Lucas. 308 pages. $4. The Macmillan Company, 60 Fifth Ave., New York, 1953.

THE NUFFIELD FOUNDATION—REPORT FOR THE YEAR ENDING 31 MARCH 1952 • 161 pages. The University Press, Oxford, England, 1952.

THE ROCKEFELLER FOUNDATION ANNUAL REPORT, 1952 • 465 pages. Illustrated. The Rockefeller Foundation, 49 W. 49th St., New York, 1953.

USE OF MOLASSES IN THE FEEDING OF FARM ANIMALS—REVIEW AND ANNOTATED BIBLIOGRAPHY • By Milton L. Scott, Ph.D. 153 pages. Sugar Research Foundation, Inc., 52 Wall St., New York 5, 1953.

THE LIFE OF CHRIST AS COMPILED FROM THE FOUR GOSPELS • By Powell B. Trotter, D.D.S. 155 pages. $3. Pageant Press, 130 W. 42nd St., New York, 1953.

25 JAHRE CARL HANSER VERLAG—1928-1953 (Catalog of books published during the last 25 years) • 72 pages. Carl Hanser, Verlag, Leonard-Eck-Strasse 7, Munchen 27, Germany, 1953.

Current Literature

THE PRODUCTION OF ARTIFICIAL LAMELLAE IN HUMAN ENAMEL

H. F. Atkinson and A. S. Prophet. Brit. D. J. 95:60 Aug. 4, 1953.

To simulate dental lamellae, sheets of varying thickness, up to half an inch, of transparent Perspex were used. A 5 per cent solution of silver nitrate in 10 per cent gelatin and *Staphylococcus albus* grown in gelatin were alternately placed on top of the Perspex sheets, and air rifle pellets were discharged to produce cracks in the sheets. It was shown that silver nitrate and the cocci penetrated into these cracks.

A method was then developed whereby cracks in human enamel can be observed under the microscope while they are being produced artificially by an appliance. Examination revealed numerous cocci in the enamel lamellae which were immersed in gelatin containing *Staph. albus*. In order to eliminate the possibility of mistaking the organisms for the stained background material, a gram-stained suspension of *Bacillus cereus* in partially polymerized acrylic monomer was used. All artificial enamel lamellae which were produced in that series contained *B. cereus*.

Since organic material and bacteria from the saliva may fill cracks in the teeth, the presence of bacteria does not necessarily mean that proteolysis of the enamel is taking place.

George M. Yamane

CHRONIC ENDEMIC DENTAL FLUOROSIS IN KENYA, EAST AFRICA

T. Ockerse. Brit. D. J. 95:57 Aug. 4, 1953.

Examinations of the teeth of European, Asian and African school children in East Africa indicate that chronic endemic dental fluorosis is widespread in certain areas of Kenya and is caused by excessive fluorine in drinking water. This fluorosis is not severe, however, probably because much of the water is from surface water which contains much less fluorine than water from boreholes in contact with volcanic rock.

The reason that mottling is more prevalent and severe among Asian children than among African children was assumed to be a dietary difference. The lack of first class protein and the high carbohydrate intake of the Asian children may increase the susceptibility to fluorosis.

The fluorine content of the water from one of the boreholes in Nairobi was 1.5 ppm as compared with 0.5 ppm of the surface water content. If the water from the other boreholes contains a similar concentration of fluorine, then the fluorine content of the total water supply probably exceeds 1.0 ppm and may be the cause of the mottling.

A considerably lower incidence of dental caries was usually associated with a moderate degree of excess fluorine in the drinking water.

Robert H. Linn

CHILDREN'S DENTISTRY

Bruce Lindsay. D. J. Australia 25:44 March 1953.

Children's dentistry has many potentialities. It is unpopular at present because it is a branch of conservative dentistry, because many dentists believe that it does not produce adequate financial rewards, because uncooperative children are a strain on the average dentist's nervous system and finally because some dentists who do not wish to treat children inform parents that dentistry for children is unnecessary.

The following are some of the advantages of dentistry for children: There is a psychological advantage because the dentist does not need to impress his patient. Humorous incidents make this type of dentistry interesting and pleasant. There are few difficulties in diagnosis. The problem of fees is simpler. The hourly fee is greater than in general practice. Parents are willing to spend money for children's dentistry even in difficult times. Operating expenses are smaller than in a general practice.

There are many methods of controlling children. Children should be made to realize that their cooperation is expected and demanded. Local anesthesia should be used to make dentistry painless. A confident mental attitude on the part of the dentist improves his handling of the child.

Most parents are cooperative; the minority who are not should be kept out of the operating room. With the parents in the waiting room, the dentist can perform his work more quickly, he is not subject to the strain of

operating under close observation, the parent is not there to interfere with methods used with difficult children, children develop confidence by overcoming fear by themselves.

The "towel technic" is reserved for especially difficult children. The open hand over the mouth and nostrils is also effective.

The most satisfactory technic for obtaining local anesthesia for cavity preparation is the intraosseous injection. Its main advantages are saving of time, completeness of anesthesia and ease of administration. It can be given to children of all ages.

To improve his method of handling children, the dentist should treat every child who comes to his office, read all textbooks on pedodontics in regard to control of children and develop a technic of local anesthesia which may be used on any child.

Joseph F. Burket

AN INVESTIGATION OF THE CARIES EXPERIENCE AND DIET OF GROUPS OF SCHOOL AND PRE-SCHOOL CHILDREN IN SYDNEY (1946-1947)

D. A. Cameron. D. J. Australia 25:50 March 1953.

Investigations of dental caries among the different populations suggest that there is a correlation between the prevalence of dental caries and the diet, considered as a whole or in relation to some one particular constituent. In Australia it has been observed that the aborigines, living on a diet not supplemented by food of the white population, have little dental caries. The prevalence of the disease among white children is obvious. No attempt has been made previously to determine the relationship of caries to the diet of the children. A survey was made in 1946 to investigate this relationship among school and preschool children in the area of Sydney.

A total of 1,635 children, aged 2 to 12 years, were examined. They were from infant and primary schools, day nurseries and the department of pedodontia at the United Dental Hospital of Sydney. The schools were scattered and selected to include samples from all economic levels of the community. Before the examination each child was given a dietary record form with instructions for recording the diet.

The teeth were examined with a plane mirror and sharp explorer. The catching of the explorer in pits and fissures and the roughness of proximal or gingival enamel were accepted as indicative of caries.

Of the children examined, 1,044 were considered in estimating the incidence of dental caries. The report on the diets was based on the 906 diet records which were returned. Of the 1,044 children, all below the age of 8 years, 117 (11 per cent) were free from caries. The mean number of DMF tooth surfaces per child increased from 1.4 for boys at the age of 2 years to 19.1 at 6 years. For girls the number increased from 2.7 at 2 years to 19.0 at 7 years. The mean number of DMF teeth per child showed a similar increase.

An analysis of variance showed that there was no difference in the mean percentage of the DMF tooth surfaces between different schools but that there was a difference between ages. These figures are similar to those reported in the United States, South Africa and Denmark.

The dietary examination showed that too high a proportion of the calorific requirements was supplied by refined carbohydrates at the expense of the protective foods. It is suggested that the wide prevalence of dental caries is related to the excessive intake of refined carbohydrates.

Joseph F. Burket

THERMAL VOLUME CHANGES AND MARGINAL ADAPTATION OF SELF-CURING RESIN FILLINGS

Spreter V. Kreudenstein. Deutsche zahnärztl. Ztschr. 8:143 July 1953.

The exposure of a tooth restoration to changes in temperature causes fluid exchange between the tooth and the restoration due to differences in their thermal expansion. Thus, the marginal adaptation of direct filling resins is hindered by fluctuations in mouth temperature. These temperature changes may cause voids at the margins.

The "pump" effect, that is, the formation of droplets on heating a dried tooth previously chilled in ice water, is the result of differential thermal volume and thermal conductivity changes in resin and tooth structures. It can be demonstrated that liquid percolates around all margins. The droplets can be formed also on heating after cooling without actual exposure of the tooth to ice water. The effluent thus formed must originate in the dentin. Microchemical analysis of this fluid is under investigation.

Resin fillings have thermal expansion coefficients many times that of the tooth structure. The linear thermal expansion coefficients of self-curing resin specimens cured under pres-

sure are often less than coefficients of specimens cured without pressure. More important are the increases in the thermal expansion coefficients when measurements are made on specimens soaked in a physiological salt solution under conditions similar to those encountered in the mouth. Increases of from 36 per cent to 65 per cent over specimens measured in dry air were observed. Differences in thermal expansion coefficient values of different brands of direct filling resins as well as of pigmented and clear resins also were observed. These variations in the thermal expansion coefficient should be considered in calculating volume changes occurring with changes in temperature.

Gerhard M. Brauer

DERMAL SINUSES OF DENTAL ORIGIN WITH REPORT OF THREE CASES

Michael Gurdin and W. J. Pangman. Plast. & Reconstruct. Surg. 2:444 June 1953.

Three cases of "cysts of the face" had been wrongly diagnosed and treated unsuccessfully by local therapy. Proper diagnosis in each case traced a draining granulomatous lesion on the face by way of a sinus to the alveolus of an asymptomatic tooth. When the tooth was extracted, chronically abscessed tissue was observed at the apex of the root.

Healing of the facial lesions occurred (1) in the first case after the extraction of the abscessed maxillary lateral incisor, excision of the old scar and involved tissues, and extraoral dissection of the sinus tract; (2) in the second case as a result of the extraction of the abscessed maxillary third molar alone, after which the sinus healed and a cordlike scar remained within the cheek; (3) in the third case after the extraction of the abscessed maxillary central incisor and intraoral excision of the sinus tract.

Rather consistent positive indications of this condition are: (1) skin papilla with chronic or recurrent drainage of pus, (2) sinus formation as determined by probing or injection and roentgenograms, (3) a cordlike structure detected on intraoral palpation, that extends from the external opening to the alveolus, (4) intraoral roentgenographic evidence of a root abscess, a dental cyst or localized osteitis.

Factors likely to confuse the diagnosis are (1) lack of history of acute dental abscess, since a chronic root abscess may occur without an acute stage, (2) negative roentgenographic evidence on routine examination, (3) an edentulous mouth—any osteolytic process of the bones or a retained root may produce sinus formation, (4) a confusing biopsy report, (5) a positive bacteriological report.

This condition should be differentiated from epidermoid cysts localized to the skin, salivary fistulae, thyroglossal sinus, branchial sinuses, or specific infections such as actinomycosis a positive bacteriological report.

The treatment should be the removal of the abscessed tooth, retained root or sequestrum with curettement of the granuloma. After such treatment most sinus tracts close promptly, spontaneously and permanently. If the sinus has persisted for a long time, however, the tract may be lined with epithelium to such an extent or so fibrosed that surgical excision is necessary. If numerous operative procedures have been resorted to before proper diagnosis and treatment, an umbilicated scar will persist, requiring secondary revision.

James Springer

TUMORS OF THE ANTERIOR CERVICAL REGION

Harold C. Spear. U. S. Armed Forces M. J. 4:821 June 1953.

The common cystic and solid tumors that occur in the anterior cervical region may be grouped according to their usual location in the midline or in the submaxillary, carotid or infrahyoid regions. The midline tumors include adenoma of the thyroid isthmus, hyperplasia of the pyramidal lobe, and cystic dermoid and thyroglossal lesions. Chronic sialadenitis, usually secondary to a calculus obstructing Wharton's duct, and mixed tumors of the submaxillary gland occur in the submaxillary triangle. Branchial cysts, lipomas, cystic hygromas, lymphomas, metastatic lesions, carotid body tumors and lateral aberrant thyroid tumors are tumors of the carotid region to be differentiated. In the infrahyoid region, the common tumors include nodular goiter, thyroid adenoma, lesions of chronic thyroiditis and thyroid cancer.

Bruce L. Douglas

Deaths

Abbott, Lyman E., St. Louis; School of Dentistry, St. Louis University, 1928; died September 14; aged 54.

Adles, Benjamin F., New London, Conn.; College of Dental and Oral Surgery, New York, 1913; died August 8; aged 74.

Alford, Stuart E., Bridgeport, Conn.; School of Dentistry, University of Pennsylvania, Philadelphia, 1919; died December 24; aged 56.

Andrews, Clifford M., York, Neb.; College of Dentistry, Creighton University, 1915; died September 3; aged 59.

Back, Leonides P., Tulsa, Okla.; Kansas City-Western Dental College, 1933; died October 9; aged 53.

Ballard, Clifton R., Norfolk, Va.; Dental Department, Meharry Medical College, 1924; died November 16; aged 52.

Balsinger, H. Ray, Wesleyville, Pa.; School of Dentistry, University of Pittsburgh, 1910; died September 8; aged 68.

Baskerville, Ralph L., Arlington, Calif.; College of Dentistry, University of Southern California, 1911; died November 26; aged 70.

Batkin, Fred A., Dinuba, Calif.; College of Dentistry, University of Southern California, 1911; died November 21; aged 67.

Beard, William S., Frisco City, Ala.; Southern Dental College, Atlanta, 1912; died January 12; aged 65.

Bednark, George J., Wilkes-Barre, Pa.; School of Dentistry, Temple University, 1924; died December 17; aged 57.

Belk, Charles A., Deer Lodge, Mont.; School of Dentistry, Washington University, St. Louis, 1902; died December 9; aged 72.

Bisewski, Frank C., Chicago; Dental School, Northwestern University, 1895; died December 21; aged 83.

Blair, Carl F., Youngstown, Ohio; College of Dentistry, Western Reserve University, 1897; died December 30; aged 78.

Bowhousen, Glynn V., Fond du Lac, Wis.; Dental School, Marquette University, 1924; died November 22; aged 52.

Brooks, Charles R., Grosse Pointe Farms, Mich.; Department of Dental Surgery, Detroit College of Medicine, 1907; died October 17; aged 68.

Calihan, Leonard Q., Braddock, Pa.; School of Dentistry, University of Pittsburgh, 1916; died January 8; aged 67.

Carreiro, George S., San Francisco; College of Dentistry, University of California, 1925; died January 3; aged 53.

Carter, Emmett M., Washington, D. C.; Dental Department, Columbian University, 1897; died November 19; aged 80.

Case, Frank D., Miami, Fla.; School of Dentistry, University of Indiana, 1897; died January 5; aged 77.

Claasen, William J., North Miami, Fla.; Dental School, Northwestern University, 1893; died October 30; aged 81.

Cohn, Alfred J., Milwaukee; School of Dentistry, University of Pennsylvania, Philadelphia, 1890; died December 15; aged 84.

Cole, Guy O., Holgate, Ohio; College of Dentistry, Ohio State University, 1897; died October 27; aged 83.

Conklin, Wirt H., West Rush, N. Y.; School of Dentistry, University of Pennsylvania, Philadelphia, 1897; died December 7; aged 78.

Connely, William F., Kansas City, Mo.; Kansas City-Western Dental College, 1923; died December 29.

Crisman, Marcus B., West Chester, Pa.; Philadelphia Dental College, 1895; died November 11; aged 85.

Crist, Joseph B., Golconda, Ill.; Marion-Sims Dental College, St. Louis, 1900; died January 11; aged 79.

Crosby, Jesse Maurice, Bradford, Pa.; Philadelphia Dental College, 1892; died December 19; aged 82.

Curran, William P., Cambridge, Minn.; College of Dentistry, University of Minnesota, 1938; died November 30; aged 39.

Cuthbertson, Charles W., Silver Spring, Md.; Dental Department, Columbian University, 1900; died November 26; aged 85.

Davis, Albert E., Seattle; died November 19; aged 72.

Droberg, Walter W., Chicago; College of Dentistry, University of Illinois, 1909; died December 15; aged 66.

Dunaier, Morris J., New York; College of Dentistry, New York University, 1914; died December 27; aged 60.

Edwards, George S., Greencastle, Pa.; School of Dentistry, University of Pennsylvania, Philadelphia, 1911; died December 17; aged 66.

Emmons, Harry E., Jr., Boston; Dental School, Tufts College, 1918; died December 6; aged 61.

English, Robert H., Oconto, Wis.; died November 15; aged 84.

Ervin, Walter C., Elmira, N. Y.; School of Dentistry, University of Buffalo, 1917; died October 10; aged 58.

Farley, Otis N., Lynden, Wash.; School of Dentistry, North Pacific College of Oregon, Portland, 1918; died January 1.

Fenton, Ralph A., Iowa City, Iowa; College of Dentistry, State University of Iowa, 1913; died January 7; aged 72.

Foley, John J., Fort Dodge, Iowa; College of Dentistry, University of Iowa, 1917; died October 8; aged 61.

Forister, Harry M., Cheyenne, Wyo.; Dental School, Marquette University, 1925; died November 21; aged 58.

Funk, Roy A., Tacoma, Wash.; Chicago College of Dental Surgery, Loyola University, 1900; died December 23; aged 77.

Gear, Earl, Marion, Ind.; Ohio College of Dentistry, University of Cincinnati, 1898; died November 18; aged 78.

Geary, Harry L., Arcadia, Calif.; Dental School, Northwestern University, 1906; died January 9; aged 76.

Giese, Elmer G., Juneau, Wis.; Dental School, Marquette University, 1925; died September 20; aged 51.

Gliebe, Francis J., San Francisco; College of Dentistry, University of California, 1923; died January 15; aged 44.

Golden, John F., Worcester, Mass.; Dental School, Tufts College, 1911; died November 21; aged 62.

Gorman, Philip J., Binghampton, N. Y.; School of Dentistry, University of Pennsylvania, Philadelphia, 1917; died December 6; aged 64.

Granger, Ed., Ada, Okla.; School of Dentistry, St. Louis University, 1910; died September 13; aged 65.

Hagberg, Rudolph A., Worcester, Mass.; Dental School, Tufts College, 1924; died December 17; aged 51.

Hallam, Charles L., Mooresville, Ind.; Indiana Dental College, 1898; died December 17; aged 84.

Hampton, Lee R., Ocala, Fla.; Dental Department, Meharry Medical College, 1912; died October 19; aged 65.

Happel, Harry, Philadelphia; Pennsylvania College of Dental Surgery, Philadelphia, 1909; died December 10; aged 68.

Hardgrove, Timothy A., Fond du Lac, Wis.; Chicago College of Dental Surgery, Loyola University, 1901; died December 15; aged 79.

Harris, Harvey L., Phoenix, Ariz.; Western Dental College, Kansas City, 1917; died November 3; aged 66.

Harrison, Arthur G., Morris, Ill.; Chicago College of Dental Surgery, Loyola University, 1889; died November 23; aged 85.

Hawkins, Homer T., Canfield, Ohio; Ohio College of Dental Surgery, University of Cincinnati, 1892; died December 6; aged 84.

Hoag, Mark R., Lock Haven, Pa.; died November 29; aged 60.

Hutto, James F., San Francisco; Dental School, Harvard University, 1949; died December 26; aged 30.

Johnson, Chester W., San Francisco; College of Dental Surgery, University of California, 1918; died December 12; aged 58.

Johnson, George G., St. Paul; College of Dentistry, University of Minnesota, 1929; died June 13; aged 53.

Kaltenbach, Louis E., Kenosha, Wis.; College of Dentistry, University of Iowa, 1891; died January 7; aged 81.

Kaser, Clayton H., Parchment, Mich.; College of Dental Surgery, University of Michigan, 1931; died January 9; aged 45.

Kennedy, William E., Indianapolis; Indiana Dental College, 1901; died December 24; aged 80.

Kinney, Harold S., Indianapolis; Indiana Dental College, 1922; died December 5; aged 55.

Kirkland, Hugh J., New York; New York College of Dentistry, 1913; died December 6; aged 62.

Kirschbaum, Alvin E., New York; School of Dentistry, University of Pennsylvania, Philadelphia, 1924; died December 3; aged 52.

Lacey, William R., Kosciusko, Miss.; Birmingham Dental College, 1908; died November 10; aged 72.

Landrum, John W., Shawnee, Okla.; Louisville College of Dentistry of Centre College, 1913; died October 15.

Lee, Fred C., Glendale, Calif.; School of Dentistry, Temple University, 1901; died December 30; aged 76.

Lewis, Harold G., Muskegon, Mich.; College of Dental Surgery, University of Michigan, 1919; died December 27; aged 58.

Lewis, Robert C., Rochester, N. Y.; School of Dentistry, University of Pennsylvania, Philadelphia, 1949; died November 29; aged 34.

Lichter, Samuel, Pittsburgh; School of Dentistry, University of Pittsburgh, 1915; died January 2; aged 61.

Liebman, Solomon, New York; College of Dental and Oral Surgery, New York, 1923; died December 20; aged 60.

Linville, Joseph A., McMinnville, Ore.; died December 28.

Lockwood, Richard C., Pasadena, Calif.; College of Dentistry, University of Southern California, 1906; died August 25; aged 70.

Ludington, Paul J., Detroit; College of Dental Surgery, University of Michigan, 1900; died January 4; aged 79.

Lyga, George G., Sparta, Wis.; Dental School, Marquette University, 1927; died September 29; aged 50.

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Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Fifth Annual Session	Nov. 8-11, 1954	Miami, Fla.
Ninety-Sixth Annual Session	Oct. 17-20, 1955	San Francisco
Ninety-Seventh Annual Session	Oct. 1-4, 1956	Atlantic City, N.J.

MEETINGS OF CONSTITUENT SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 25-27	Biloxi, Miss.	F. A. Finney, Jr.	1045 Forrest Ave., Gadsden
Alaska	Aug. 2-5	Anchorage	C. J. Pearson	500 K St., Anchorage
Arizona	Apr. 21-24	Phoenix	E. M. Scott	17 E. Weldon Ave., Phoenix
Arkansas	Apr. 4-7	Little Rock	D. M. Hamm	Box 89, Clarksville
California	Apr. 26-28	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	May 3-5	Los Angeles	J. P. Bowers	124 W. Lime Ave., Monrovia
Colorado	Oct. 3-6	Colorado Springs	W. R. Humphrey	724 Republic Bldg., Denver
Connecticut	June 2-4	Hartford	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Dec. 8	Wilmington	R. J. Zurkow	152 S. State St., Dover
District of Columbia	June 8	Washington	Z. B. Lloyd	2007 R St., N.W., Washington
Florida	Apr. 25-28	Daytona Beach	B. S. Carroll	706 Professional Bldg., Jacksonville
Georgia	Oct. 10-13	Atlanta	J. W. Yarbrough	Bibb Bldg., Macon
Hawaii	June 23-26	Honolulu	J. H. Dawe	810 N. Vineyard St., Honolulu
Idaho	Apr. 29, 30	Boise	C. G. Hanson	409 11th Ave., S., Nampa
Illinois	May 10-13	Springfield	P. W. Clopper	623 Jefferson Bldg., Peoria
Indiana	May 17-19	Indianapolis	E. E. Ewbank	Box 96, Kingman
Iowa	May 3-5	Des Moines	H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas	May 16-19	Wichita	F. A. Richmond	861 Brotherhood Bldg., Kansas City
Kentucky	Apr. 5-7	Louisville	A. B. Coxwell, Jr.	1976 Douglass Blvd., Louisville
Louisiana	Apr. 21-24	Baton Rouge	J. S. Bernhard	2515 Line Ave., Shreveport
Maine	June 24-26	Rockland	S. M. Gower	Box 27, Skowhegan
Maryland	May 3-5	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore
Massachusetts	May 2-5	Boston	H. E. Tingley	12 Bay State Road, Boston
Michigan	Apr. 25-28	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota			C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 5-8	Biloxi	B. A. Cohen	306 Plaza Bldg., Jackson
Missouri	June 13-16	St. Louis	E. D. Suggett	201 Merchants Bank Bldg., Jefferson City
Montana	May 6-8	Great Falls	E. G. Vedova	Roundup
Nebraska	May 10-12	Omaha	F. A. Pierson	1112 Federal Securities Bldg., Lincoln
Nevada	June 18-20	Cal-Neva, Lake Tahoe	O. M. Seifert	506 Humboldt St., Reno
New Hampshire	June 13-15	Whitefield	F. E. Williams	814 Elm St., Manchester
New Jersey	May 4-6	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 23-26	Santa Fe	J. S. Eilar	Medical Arts Square, Albuquerque
New York	May 10-12	Buffalo	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 16-19	Pinehurst	R. D. Coffey	Kibler Bldg., Morganton
North Dakota	May 23-25	Bismarck	V. B. Keltgen	517 de Lendrecie Bldg., Fargo
Ohio	Oct. 17-20	Cincinnati	E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 20-23	Oklahoma City	D. Robertson	434 N.W. 13th St., Oklahoma City
Oregon			W. H. Hurley	308 Selling Bldg., Portland
Panama Canal Zone			A. L. Teitel	U.S. Naval Station, Rodman
Pennsylvania	Oct. 4-6	Pittsburgh	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico			F. Ordóñez	1558 Ponce de León Ave., Stop 23, San Juan
Rhode Island			N. G. Migliaccio	1467 Westminster St., Providence
South Carolina	May 23-25	Columbia	J. R. Owings	7 Medical Court, Greenville
South Dakota	May 20-22	Sioux Falls	L. N. Thelen	310A W. 18th St., Sioux Falls
Tennessee	May 10-12	Chattanooga	W. L. McCulley	Brown Bldg., Cleveland

State	Date	Place	Secretary	Address
Texas	Apr. 25-29	Dallas	W. Ogle	3607 Gaston Ave., Dallas
Utah	Apr. 8-10	Salt Lake City	K. L. Dedekind	914 Medical Arts Bldg., Salt Lake City
Vermont	May 16-18	Woodstock	W. J. Reardon	18 Madison St., Rutland
Virginia	Apr. 12-14	Richmond	W. T. McAfee	705 Colonial National Bank Bldg., Roanoke
Washington			W. B. Martin	Medical-Dental Bldg., Seattle
West Virginia	July 25-28	White Sulphur Springs	G. N. Casto, Jr.	710½ Lee St., Charleston
Wisconsin	Apr. 20-22	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming	June 20-23	Rock Springs	T. J. Drew	State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Alabama	June 21-24*†	Birmingham	W. L. McCarty	200 Professional Center, Montgomery
Alaska			P. H. Williams	Box 2122, Juneau
Arizona	June 21-26*†	Florence	R. K. Trueblood	107 East A Ave., Glendale
Arkansas	June 21-25*†	Little Rock	H. O. Weatherly	205 Halter Bldg., Conway
California	June 21	Los Angeles	K. I. Nesbitt	507 Polk St., San Francisco
	July 26	San Francisco		
Colorado	June 21-25	Denver	J. M. Peabody	724 Republic Bldg., Denver
Connecticut	June 14-19*†	Bridgeport	C. G. Brooks	302 State St., New London
Delaware	June 28-30*†	Wilmington	P. K. Musselman	143 W. Main St., Newark
District of Columbia			W. T. Birthright	Suite 718, 1835 Eye St., N.W., Washington
Florida	July 12-22*†	Jacksonville	A. W. Kellner	P. O. Box 155, Hollywood
Georgia			S. H. Yarbrough	12 Medical Arts Bldg., Columbus
Hawaii			H. L. Houvener	427 Dillingham Bldg., Honolulu
Idaho	June 28-30	Boise	R. E. Blickenstaff	1023 Fourth St., S., Nampa
Illinois			W. A. McKee	503 Wood Bldg., Benton
Indiana	June 15-18*†	Indianapolis	C. A. Frech	504 Broadway, Gary
Iowa	May 24-28*†	Iowa City	D. J. FitzGerald	615 Brick & Tile Bldg., Mason City
Kansas	June 1-4	Kansas City, Mo.	G. L. Teall	Box 71, Hiawatha
Kentucky	June 7-10	Louisville	R. M. Justice	1330 Central Ave., Ashland
Louisiana	June 6-10	New Orleans	R. C. Steib	833 Maison Blanche Bldg., New Orleans
Maine	June 28-30	Boston	R. A. Derbyshire	Box 387, Skowhegan
Maryland	June 7-9‡		H. Levin	3429 Park Heights Ave., Baltimore
Massachusetts	June 21-25*‡		R. A. Barrette	Rm. 33, State House, Boston
	June 23-25†‡			
Michigan	June 6-12	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit
Minnesota	June 14-18	Minneapolis	M. G. Walls	1470 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 15-17	Jackson	J. C. Boswell	508 Lamar Life Bldg., Jackson
Missouri	June 7-12	St. Louis	R. R. Rhoades	414 Central Trust Bldg.,
		Kansas City		Jefferson City
Montana	July 12-16	Helena	V. J. Quinn	301 Phoenix Bldg., Butte
Nebraska	June 7-11	Lincoln	H. E. Weber	1210 Federal Securities Bldg., Lincoln
Nevada	June 21	Reno	R. Whitehead	Suite 6, Masonic Temple, Reno
New Hampshire	June 18, 19	Boston	S. G. Markos	8 Renaud Ave., Dover
New Jersey	June 2-4*	Trenton	W. A. Wilson	150 E. State St., Trenton
	June 7, 8*	Philadelphia		
	June 14, 15*	New York		
	June 23, 24†	New York		
New Mexico	June 21-24	Santa Fe	J. J. Clarke, Sr.	Artesia
New York	June 24, 25*‡		D. W. Beier	23 S. Pearl St., Albany
	June 29-July 2*‡			
	June 24, 25†‡			
	June 29, 30†‡			
North Carolina	June 28-July 2	Chapel Hill	F. O. Alford	1109 Liberty Life Bldg., Charlotte
North Dakota	July 12-16	Fargo	A. L. Pushor	Lisbon
Ohio	June 17-19	Columbus	H. B. Smith	322 E. State St., Columbus
	June 21-23			
Oklahoma	June 28-30		R. P. Keidel	403 Surety Bldg., Muskogee
Oregon	June 14-17	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
Pennsylvania	June 22-27*†	Philadelphia	A. M. Stinson	Dept. of Public Instruction, Box 911, Harrisburg

State	Date	Place	Secretary	Address
Puerto Rico			J. Mercado C.	Box 3717, Santurce
Rhode Island			F. M. Hackett	267 Academy Ave., Providence
South Carolina	June 17-19	Columbia	T. C. Sparks	1315 Pickens St., Columbia
South Dakota	June 20-23	Sioux Falls	H. T. Aker	Canton
Tennessee	June 14-18	Memphis	F. S. Maxey	804 Bennie Dillon Bldg., Nashville
Texas	June 13-19*	Dallas	R. T. Weber	312 Capital National Bank Bldg., Austin
Utah			N. E. Munk	201 Cache Valley Bank Bldg. Logan
Vermont	June 28-30	Burlington	P. M. Fitch	Newport
Virginia	June 7-12* June 7, 8†	Richmond	J. M. Hughes	715 Medical Arts Bldg., Richmond
Washington			M. L. Mower	National Bank of Commerce Bldg., Olympia
West Virginia	June 21-23*†	West Liberty	C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin	June 14-18*†	Milwaukee	S. F. Donovan	Tomah
Wyoming			W. A. Hocker	212 O & S Bldg., Casper

*Dental examination. †Dental hygiene examination. ‡Write to secretary of dental examining board for information on locations of examinations. §Approximate dates—verify with state dental examining board.

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
Academy of Denture Prosthetics	Apr. 11	Miami Beach, Fla.	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
Algerian Federation of Dental Societies	Apr. 12-18	Oran, Algeria	J. Nahon-Fauchier	Maison Du Medecin 6, Rue Général Joubert, Oran, Algeria
American Academy of Dental Medicine	May 14-16	Philadelphia	W. M. Greenhut Secy.	124 E. 84th St., New York
American Association of Orthodontists	May 16-20	Chicago	F. A. Squires Secy.	Medical Centre, White Plains, N. Y.
American Board of Oral Surgery	May 8-10	Chicago	L. M. FitzGerald Secy.	718 Roshek Bldg., Dubuque, Iowa
American Board of Orthodontics	May 11-15	Chicago	C. E. Martinek Secy.	661 Fisher Bldg., Detroit
American Dental Society of Europe	July 6-9	Paris, France	J. P. Molony Hon. Secy.	110 Harley St., London W.1, England
American Public Health Association	Oct. 11-15	Buffalo	R. M. Atwater Exec. Secy.	1790 Broadway, New York
American Society of Oral Surgeons	Nov. 3-6	Hollywood, Fla.	R. F. Whalen Exec. Secy.	1112 E. Clay St., Richmond, Va.
Ark-La-Tex Dental Congress	Aug. 16	Shreveport, La.	M. Monsour Chm.	Medical Arts Bldg., Shreveport, La.
British Dental Association	May 10-14	Blackpool, England	H. P. Buchanan Secy.	13 Hill St., Berkeley Square London W.1, England
Chicago Dental Society	Feb. 6-9 1955	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago
Council on Dental Education, Dental Aptitude Tests			S. Peterson Secy.	222 E. Superior St., Chicago
Federation Dentaire Internationale	June 8-13	Scheveningen, The Hague, Holland	G. H. Leatherman Secy. Gen.	35, Devonshire Place, London W.1, England
Fifth Annual Berkshire Conference	June 20-24	Falmouth, Mass.	I. Glickman	Tufts College Dental School, 136 Harrison Ave., Boston
Great Lakes Society of Oral Surgeons	May 1, 2	Toronto, Can.	B. B. Cook Secy.	10314 Puritan Ave., Detroit
Italian Congress of Dentistry and Stomatology, Twenty-ninth Congress	Sept. 13-18	Venice, Italy	U. Saraval Dir.	Campo Manin 4017, Venice, Italy
National Board of Dental Examiners	Dec. 6, 7		G. J. Casey Secy.	222 E. Superior St., Chicago
New England Dental Society	Oct. 20, 21	Boston	F. L. Finley, Jr. Secy.	43 Farmington Ave., Hartford, Conn.
Ninth Pacific Coast Dental Conference	June 1-5	Banff, Alberta, Can.	H. B. Powell Secy.	Greyhound Bldg., Calgary, Alberta, Can.
Pacific Coast Society of Prosthodontists	May 29, 30	Seattle	A. W. Spaulding Secy.	4350 Eleventh Ave., Los Angeles
Seventh New Orleans Dental Conference	Oct. 24-27	New Orleans	V. B. Marquer Secy.	2213 S. Carrollton Ave., New Orleans
Southern Society of Orthodontists	Oct. 31-Nov. 3	Washington, D.C.	M. D. Edwards Secy.	132 Adams Ave., Montgomery, Ala.
Southwestern Society of Orthodontists	Oct. 10-13	Oklahoma City	F. A. Boyd Secy.	1502 N. Third St., Abilene, Texas

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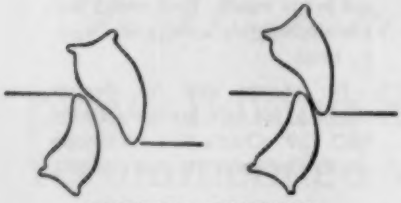

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Be sure to indicate your arrival time in Miami. Reservations will be held only until 6 p.m. of the day you indicate when you will arrive in Miami. Failure to notify the hotel of any last minute change in your arrival time may result in cancellation of the reservation.

Names of all persons who intend to occupy the accommodations must be listed on the application.

List four choices of hotels. Confirmation will be sent to the applicant indicating which hotel has accepted the reservation.

Write the A.D.A. Housing Bureau in Miami if you wish to cancel the reservation.

A.D.A. Housing Bureau • 320 N.E. Fifth Street, Miami, Florida

(Please print or type) A.D.A.

Applicant:

Name_____

_____
(Street address) (City) (Zone) (State)

Arrival in Miami_____ a.m. / p.m. Leaving_____

Accommodations:

Hotel_____ (First choice) Hotel_____ (Third choice)

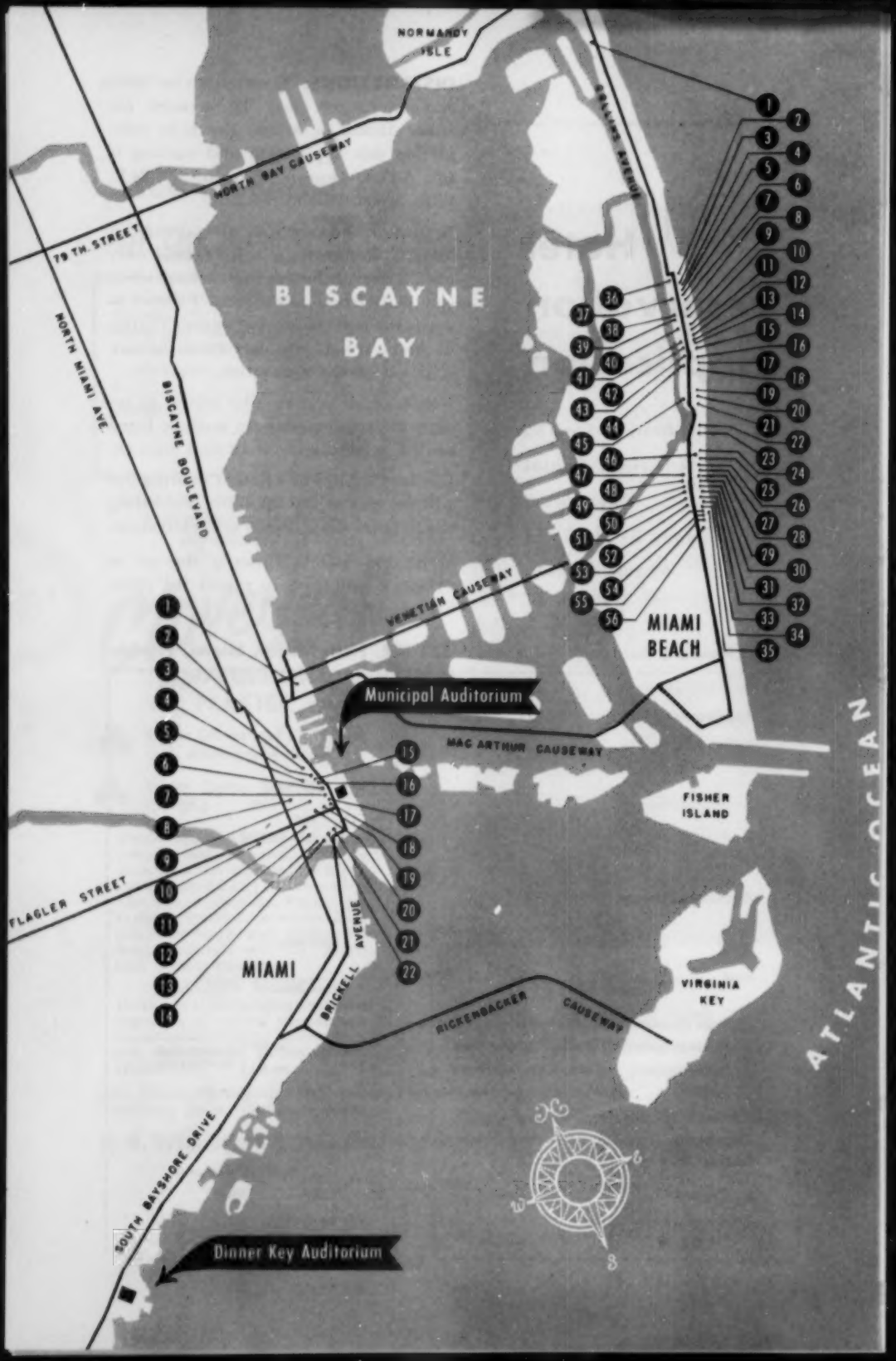
Hotel_____ (Second choice) Hotel_____ (Fourth choice)

☐ Single occupancy, rate to range from $_____ to $_____ per day.
☐ Double occupancy, double bed, rate to range from $_____ to $_____ per day. } 2 names must be listed below
☐ Double occupancy, twin beds, rate to range from $_____ to $_____ per day. }
☐ Suite of_____ rooms, including parlor, rate to range from $_____ to $_____ per day.

Occupants: (use an extra page for listing additional names if necessary)
Room will be occupied by:

_____
(Name) (Address) (City) (State)

_____
(Name) (Address) (City) (State)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Hotels in **MIAMI**

Key no.	Hotel	Single	Double
2	Alcazar	$5.00	$6.00-$ 7.00
11	Alhambra		7.00
9	Belfort	5.00	6.00- 7.00
16	Berni		5.00- 7.00
5	Biscayne Terrace	8.00	10.00- 14.00
7	Columbus	6.00- 7.00	8.00- 12.00
8	Cortez	4.00	5.00- 7.00
12	Dallas Park		10.00
10	El Comodoro	5.00- 6.00	8.00- 12.00
15	Everglades	5.00- 8.00	8.00- 12.00
17	Leamington		6.00- 7.00
3	Liberty		6.00
18	McAllister	5.00- 7.00	8.00- 12.00
6	Miami Colonial	5.00- 6.00	8.00- 10.00
19	Paramount		6.00- 8.00
21	Patricia	5.00	7.00
4	Plaza	5.00	7.00- 8.00
20	Ponce de Leon	8.00	10.00- 12.00
14	Robert Clay	5.00- 6.00	5.00- 7.00
22	Towers	4.00	6.00
13	Tuttle		6.00
1	Venetian	5.00- 6.00	6.00- 8.00

Hotels in **MIAMI BEACH**

Key no.	Hotel	Single	Double
7	Atlantic Towers	$ 7.00	$ 9.00-$
21	Atlantis	5.00	6.00
22	Belmar	8.00	10.00- 12.00
20	Billows		6.00
9	Cadillac		6.00- 8.00
43	Capri	6.00	8.00
11	Caribbean	6.00	8.00
50	Catalina		5.00- 6.00
40	Claridge	3.00	5.00
37	Continental	4.00	5.00
27	Cromwell	6.00	8.00
38	Croydon Arms	5.00	6.00
45	Del Prado	5.00	6.00- 8.00
53	Delano		10.00
56	di Lido		10.00- 14.00
47	Dorchester	4.00	5.00
41	El Morocco	5.00	8.00
44	Embassy	6.00	8.00
4	Empress		10.00- 14.00
51	Gale	4.00	5.00
5	Good	4.00- 6.00	7.00- 11.00
8	Lord Tarleton	10.00	12.00
49	Maxine		6.00
1	Monte Carlo	8.00-12.00	9.00- 13.00
54	National		6.00
30	Nautilus		15.00
12	Ocean Grande	4.00	5.00- 7.00
13	Patrician	5.00	6.00
10	President Madison	$7.00	$8.00
23	Promenade	8.00	10.00- 12.00
42	Rendale	4.00	5.00
32	Richmond	5.00	6.00
16	Robert Richter	6.00	8.00
25	Roney Plaza		10.00- 14.00
55	Sagamore		8.00
52	San Juan	5.00	6.00
6	San Marino	8.00	10.00
18	Sans Souci		10.00- 14.00
17	Saxony		12.00
34	Seacomber		10.00
26	Sea Gull		8.00- 10.00
31	Shelbourne	8.00	10.00- 12.00
48	Shelby	4.00	5.00
29	Shore Club		8.00- 12.00
14	Shoremede	8.00	10.00
2	Sorrento	8.00	10.00
33	South Seas	5.00	6.00
3	Sovereign		10.00
35	Surfcomber	8.00	10.00
36	Surrey		8.00
46	Town House		6.00
24	Traymore	5.00- 8.00	6.00- 10.00
19	Triton	4.00	6.00- 8.00
28	Vanderbilt	6.00	8.00
15	Versailles		8.00- 12.00
39	Wilshire		4.00

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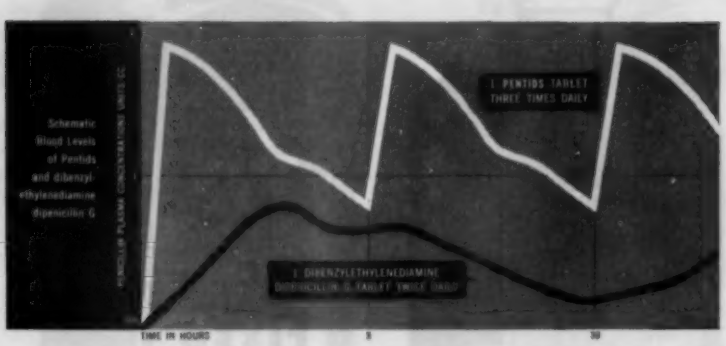

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These new modernly designed posters have color, sparkle, life and interest, and each presents an important dental health lesson.

The posters are 17" x 22" in size and suitable for display in the dental office or elementary school classroom.

The short message on each poster will create a new interest in dental health on the part of both teachers and children.

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STAINLESS STEEL

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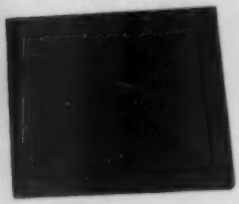

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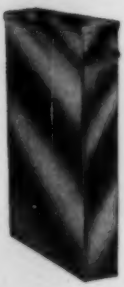

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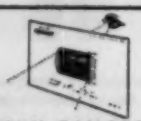

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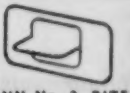

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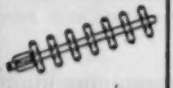

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NOTE: Instruments must be washed free of pus, blood, protein material or soap and immersed for 15 minutes in the germicidal solution. Instruments suspected of contamination with spores of Mycobacterium Tuberculosis, hinged instruments and those with deep narrow crevices, as well as hypodermic needles should be sterilized by heat.

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CALIFORNIA—For lease, six-room dental office. Carpet, linoleum, plumbing and electricity installed. 28 car parking lot. Five physicians in building, 30 physicians on street. $100 per month. Owner, C. V. Bonham, Realtor, 898 N. Garey Ave., Pomona, Calif. Phone Ly. 23302 or 22588.

●

CALIFORNIA—Culver City, corner suite of offices on major corner, reasonable rent. Fast growing community. Direct replies to Bennie Wilson, Realtor, 12508 Washington Blvd., Venice, Calif.

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CONNECTICUT—For sale. Modern, 2-chair; fully equipped operating rooms, laboratory, x-ray, business office, etc. Air-conditioned. Hygienist. Annual gross $22,000 and growing. Located on most prominent corner of nice town. Also available, lovely split-level home in suburbs. Will help finance. Wonderful opportunity. Address A.D.A. Box No. 605.

●

ILLINOIS—For rent. Space in medical building to young dentist. Excellent opportunity. Peoria area. Reasonable rent. Address A.D.A. Box No. 603.

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ILLINOIS—For sale. Perma-stone bungalow dental office building, fully equipped, including General Electric x-ray, new S. S. White unit and motor chair. Well-established practice, serving large rural area. Office and practice must be seen to be appreciated. Moving to Florida. Direct replies to Dr. A. Deo Klein, Onarga, Ill.

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ILLINOIS—For sale. General practice, established 60 years. Industrial and farming community. Present owner dislikes private practice, returning to federal service. Simply assume payments of $110 per month on practice and x-ray. Ritter unit, chair, sterilizer, x-ray, Castle lamp. Address A.D.A. Box No. 606.

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INDIANA—Office for sale. Busy, established, two-chair practice. $89.00 per month for office, equipment, heat, electricity, water and gas. Excellent for newly licensed dentist with little cash. Direct replies to Mrs. Ernest Telfer, 519 S. 9th St., Vincennes.

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KANSAS—Air-conditioned dental suite for rent. One or two operating rooms. Suburban Wichita shopping center. New clinic building with established physician in general practice. Unequaled opportunity. Direct replies to Dr. H. F. Dobson, Haysville Clinic, Haysville, Kan.

MASSACHUSETTS—For sale, corner dental office, overlooking park, in Springfield's business center. Two operating rooms, hygienist's room, laboratory, reception room, business office, dark room. Direct replies to Dr. Robert J. Haley, 340 Bridge St., Springfield, Mass.

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MASSACHUSETTS—For sale, on Cape Cod, attractive, recently remodeled, village home, ideally situated and perfectly suited for combination office and residence for dentist desiring to establish practice on beautiful Cape Cod. Full description on request. Personal inspection invited. Price $22,500. Liberal bank mortgage available. Direct replies to Otto Kley, Realtor, South Yarmouth, Mass. Tel. Hyannis 1639-M3.

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MASSACHUSETTS—For rent, three front rooms, central, with water, plumbing and dark room. Town of 15,000 population. Four M.D.'S—no dentist. Direct replies to Dr. L. C. LaZerte, 11 Whitman St., Williamsett, Mass.

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MICHIGAN—Excellent practice for rent with option to buy. Air-conditioned, completely equipped office in central location. Large industrial expansion here. Owner in Navy, may not return to Michigan. Address A.D.A. Box No. 607.

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MICHIGAN — For sale, general practice, centrally located, fast growing community of 20,000. Two-chair modern office in excellent location. Disability from service forcing change. Hunting, fishing resort close. Address A.D.A. Box No. 608.

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NEW JERSEY—Reasons of health force sale well-established dental practice and income-producing dwelling. Prominent Linden location, fast-growing industrial community. Completely equipped 3-room suite, plus owner's apartment. Second floor apartment provides excellent income. Outstanding opportunity young dentist, experienced practitioner. Direct replies to Van Horn & Dolan, 250 N. Broad St., Elizabeth, N. J.

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NEW YORK—For sale, practice and/or equipment in Ozone Park. Direct replies to F. Augello, 133-22 — 85th St., Ozone Park, N. Y.

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TEXAS—For sale. Complete equipment and supplies. Trident, motor chair. Attractive, modern, downtown one-chair office, 4th floor, viewing Corpus Christi Bay. Established 10 years. Ideal location. Owner specializing. Moving June 15th. Address A.D.A. Box No. 609.

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WASHINGTON—For sale, new two-chair, bungalow office, with or without equipment. Practice is excellent, serves large rural area on Puget Sound, 30 minutes to Seattle. Must move because of ill health. Address A.D.A. Box. No. 610.

OPPORTUNITIES AVAILABLE

CALIFORNIA—Wanted, dentist for rural health program, which includes education for prevention. Clinic facilities, all equipment provided. Compensation arrangements are open. California license required. Direct replies to Richard Ricklefs, M.D., Hoopa, Calif.

•

COLORADO—Associate position available in a Group for dentist interested in exodontia. Oral surgery certification not required. Should be prepared and willing to do prophylaxes and fillings. Position to carry salary with eventual partnership in prospect. Address A.D.A. Box No. 611.

•

CONNECTICUT—Young man interested in orthodontics, or with some training. Marvelous opportunity for association with older man. Connecticut license will be necessary. Answer fully. Address A.D.A. Box No. 612.

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MICHIGAN—Wanted, public health dentist, preferably with experience in children's dentistry, to direct public health dental program, including children's clinic. Must have or be eligible for Michigan license. Salary $7500. Apply, giving complete information as to training and experience, plus references, to Director, Lansing-Ingham County Health Dept., 207 City Hall, Lansing, Mich.

•

NORTH CAROLINA—Want dentist to locate in small town, population 1,000, plus 3,000 surrounding. Office in doctors' building. Lions Club will help to purchase equipment needed. Housing available. Direct replies to R. W. Speers, M.D., Claremont, N. C.

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NORTH DAKOTA—Dentist wanted for thriving community. Good practice. Newly completed clinic building. Direct replies to Community Clinic Building, Inc., Drake, N. D.

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OHIO—Urgent need for hygienist in ideal location in above-average income area in Cincinnati. First floor of new, air-conditioned building. Completely equipped offices, in center of delightful suburban community. Pleasant atmosphere. Full schedule; remuneration 50% of charge. Direct replies to John Regenos, D.D.S., 6034 Hamilton Ave., Cincinnati 24, Ohio.

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PENNSYLVANIA — Excellent opportunity for draft-exempt young man interested in orthodontics. Give full particulars as to age, date of graduation and qualifications. Address A.D.A. Box No. 613.

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WISCONSIN—Modern, two-chair office in central Wisconsin city, with a drawing area of 6,000. Only dentist. Leaving to specialize. Replacement urgently needed. Address A.D.A. Box No. 614.

OPPORTUNITIES WANTED

CALIFORNIA—1954 graduate Ohio State College of Dentistry, veteran, family man, desires association with ethical established California dentist, contingent on passing California State Board examination in July 1954. Address A.D.A. Box No. 596.

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CALIFORNIA—Dentist, California license. One year general internship, plus five years additional military experience. Desires location or association, part or full time, southern part of state. Address A.D.A. Box No. 616.

•

CALIFORNIA-PENNSYLVANIA — Dentist, returning from Navy, desires association, location or practice. Pennsylvania, California licenses. Age 29. Three years' experience, including one year rotating internship. Available in June. Address A.D.A. Box No. 620.

EASTERN STATES—Dentist, June graduate, desires to purchase thriving practice, preferably in eastern states. Prefer suburban community and wish to have own accountant examine books. Request as much pertinent information as available in initial reply. Address A.D.A. Box No. 621.

•

KENTUCKY-NEW YORK—Oral surgeon, age 26, completing training period June 1954. Three years general practice USAF; year graduate training; 2 years' hospital residency. New York, Kentucky licenses. Seeks association or location. Address A.D.A. Box No. 615.

•

MICHIGAN—Young Army dentist, being discharged June 30, desires location, practice or association in Michigan. Training includes accredited internship. Prefers small community. Direct replies to Lt. Charles Nelson, Qtrs. 113, Fort Sheridan, Ill.

•

NEW YORK—Dentist, New York license, draft-exempt, 9 years' general practice, including 5 years' teaching experience, wishes association with dentist or clinic. Purchase considered. Have following and equipment. Address A.D.A. Box No. 618.

•

NEW YORK—Exodontist and oral surgeon, one year internship oral surgery and general anesthesia, 3 years' teaching and specialty practice, 2 years' Navy duty as oral surgeon, 1 year overseas. Desires association. Licensed New York state. Would take other state Boards. Address A.D.A. Box No. 623.

•

PENNSYLVANIA—Dentist, experienced in private practice, now completing service tour, wishes to purchase established Pennsylvania practice. Home-office preferred. Will consider good association. Age 30. Address A.D.A. Box No. 622.

•

SOUTHEASTERN STATES — Orthodontist, Florida, Alabama, Louisiana licenses. Two years' university graduate work. Prefer location near water. Address A.D.A. Box No. 602.

•

WASHINGTON — Dentist, Washington license, completing Army service in June, desires temporary or permanent practice or association in Puget Sound area. Graduate University of Iowa 1951, one year rotating internship Madigan Army Hospital. Age, 30. Direct replies to Lt. R. F. Sievers, 2114-1 ASU, Dental Det. Camp Pickett, Va.

•

NURSE ANESTHETIST—Wishes position in established oral surgeon's office. Long experience, nitrous oxide and oxygen—McKesson machine; Vinethene and ether. Will travel anywhere. Write full particulars. Address A.D.A. Box No. 617.

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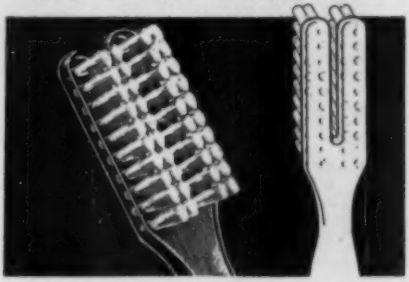

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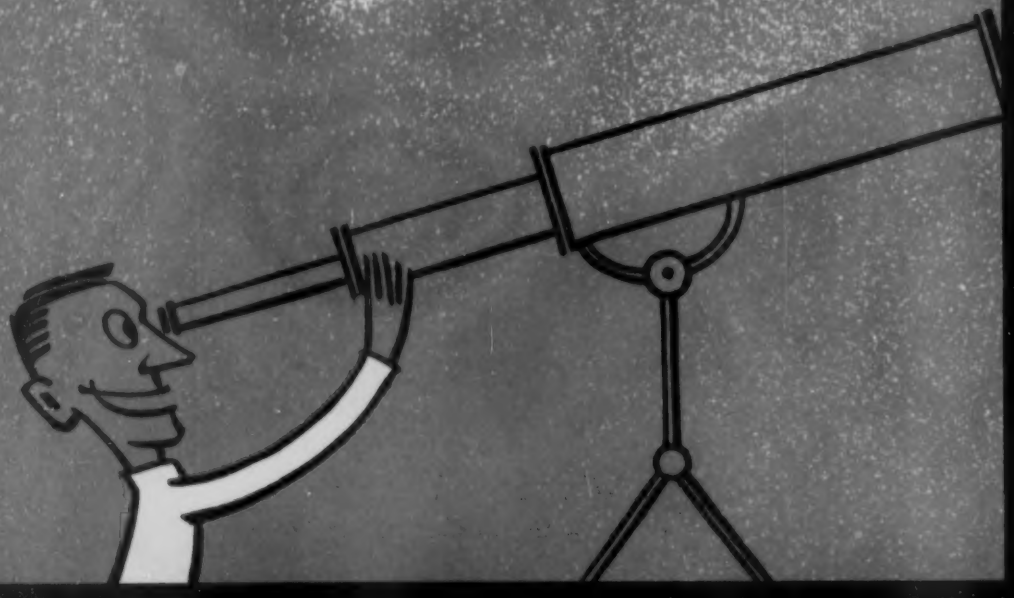

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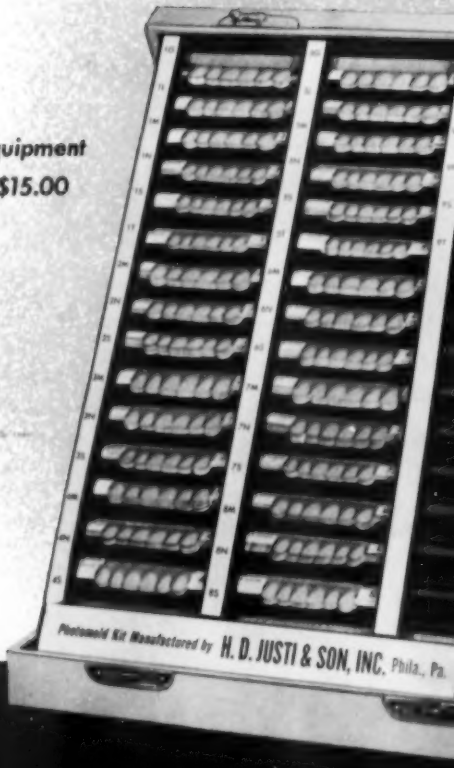

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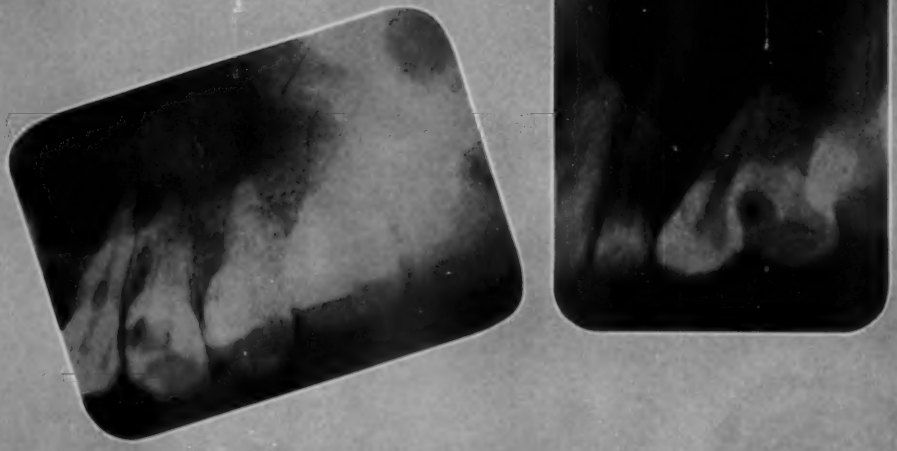

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Whenever initial radiographs leave a question as to actual conditions, sound procedure calls for *additional evidence.*

As a matter of fact, sound procedure always calls for two radiographic steps.

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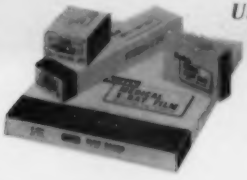

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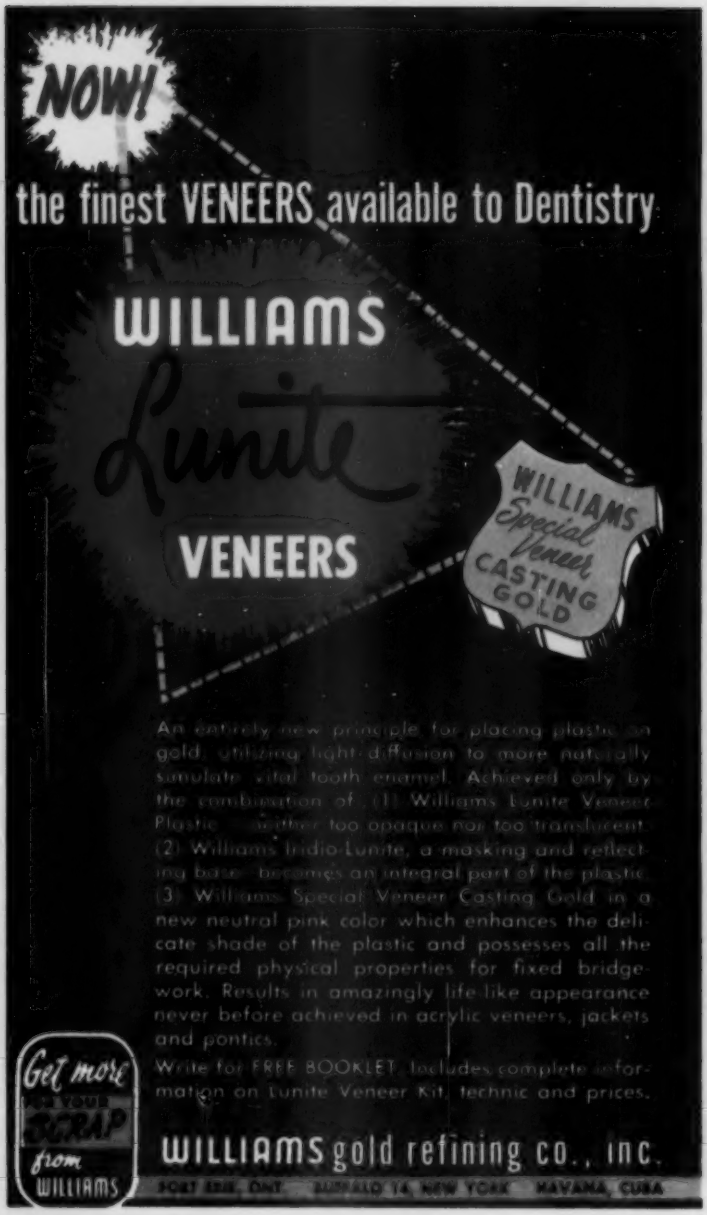
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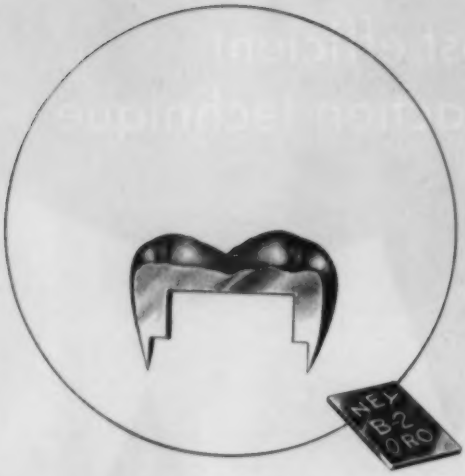

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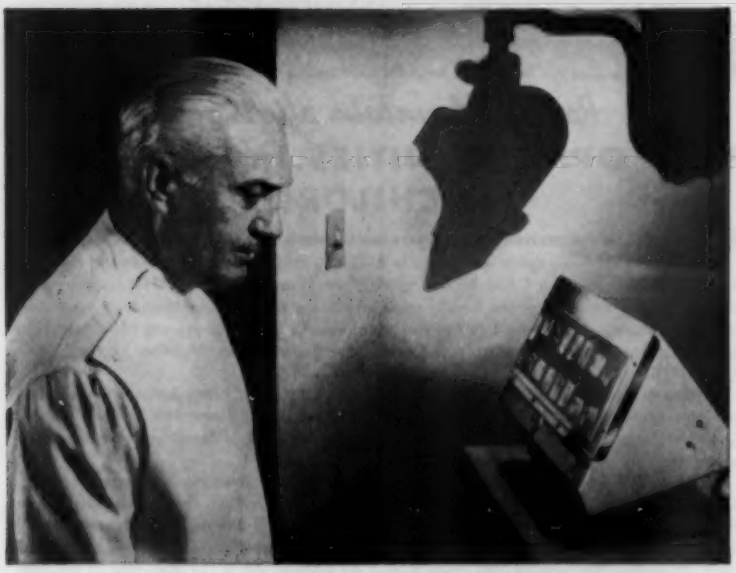

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Fig. 1

Fig. 2

Fig 3

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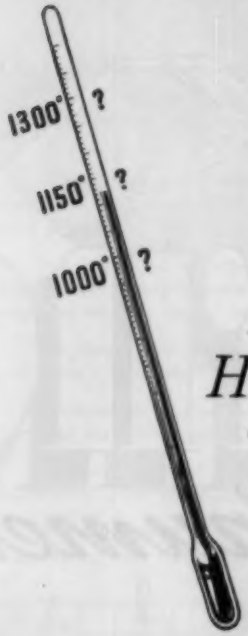

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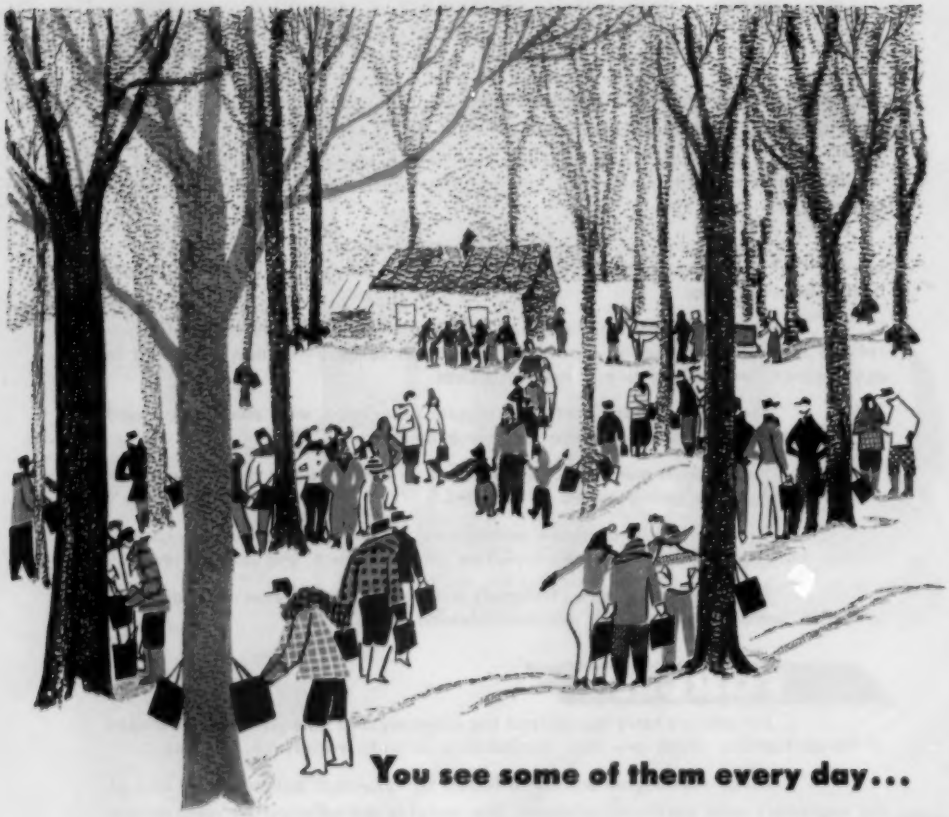

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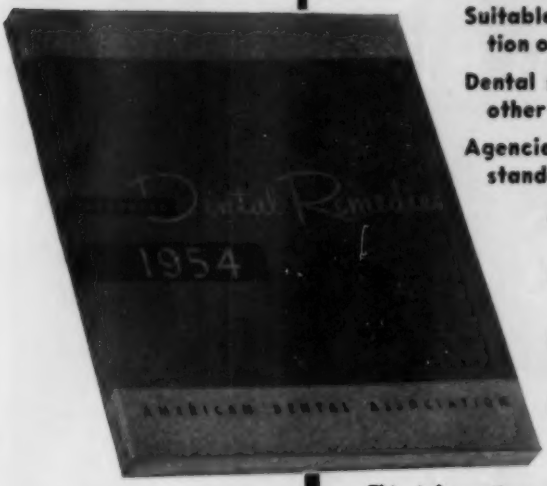

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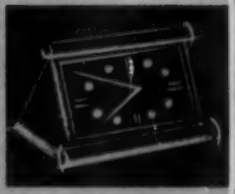

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(tests made under load of 2,500 p.s.i.)

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